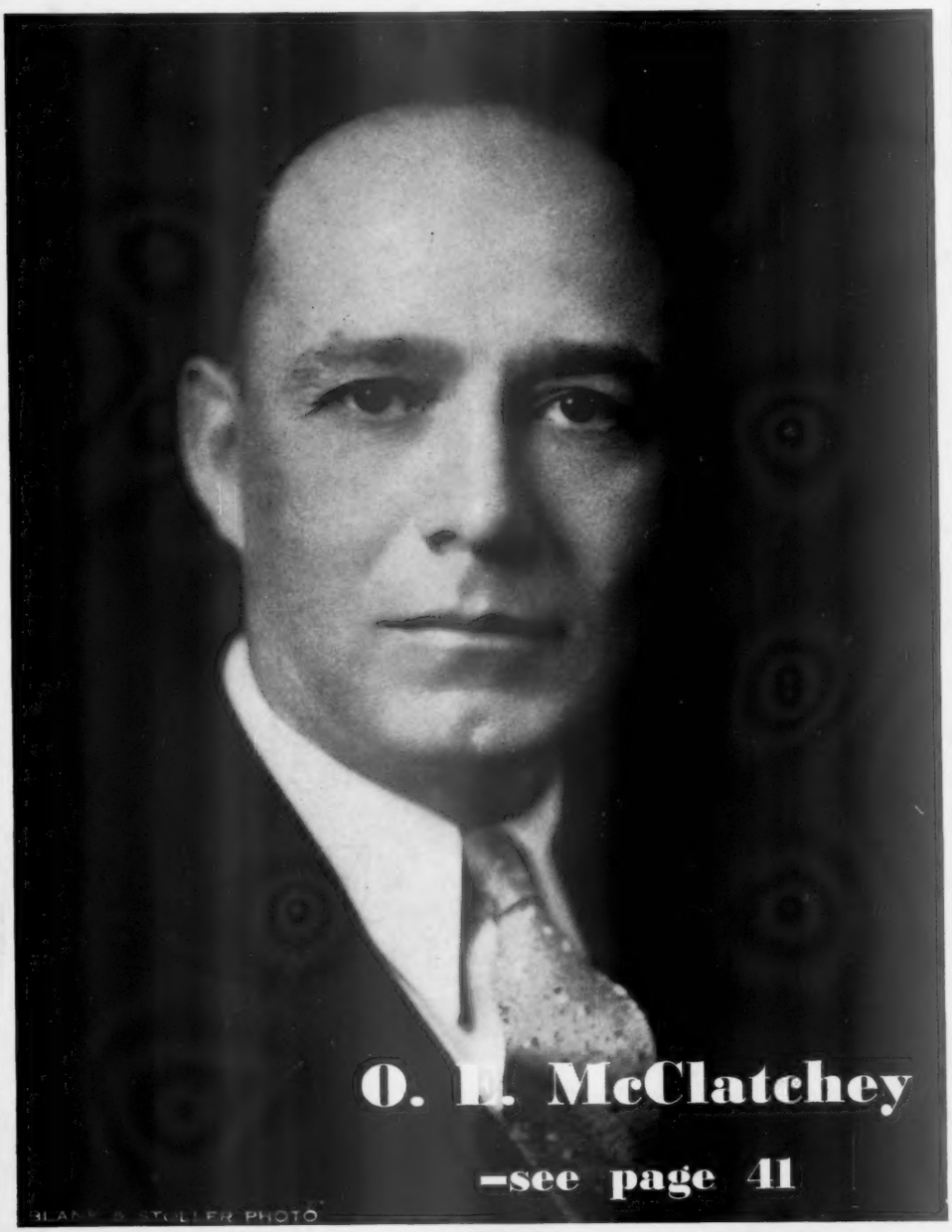
PURCHASING

THE NATIONAL MAGAZINE FOR PURCHASING AGENTS • SINCE 1915



O. E. McClatchey

–see page 41

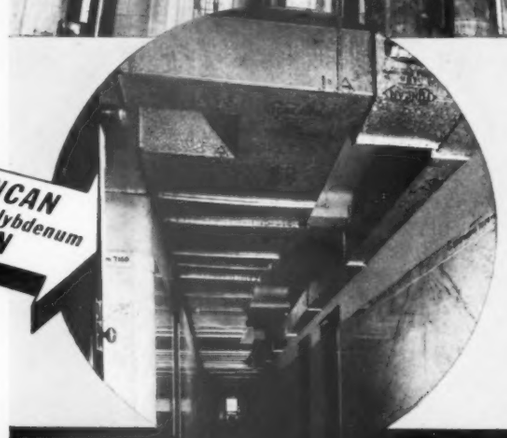
A CONOVER • MAST PUBLICATION OCTOBER 1939 205 EAST 42nd STREET, NEW YORK

MODERN METALS
bring better performance

Modern metals are made to do specific tasks. Some save weight—some add strength—some fight corrosion—all improve in some manner the performance of equipment and save money for the manufacturer or user. What they have done for others they can do for you.

FOR CORROSION RESISTANCE

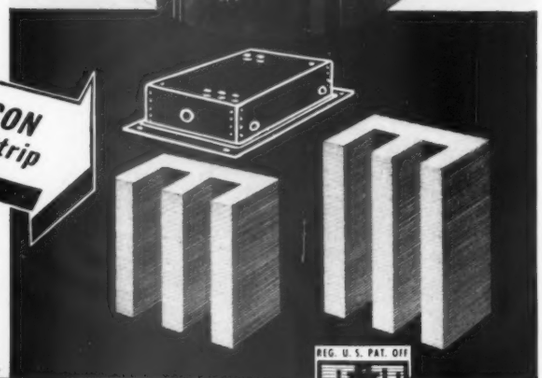
Thirteen years ago, industrial chemists were searching for a metal that would withstand the corrosive action of nitric acid. ENDURO* Stainless Steel was installed in the pilot plant that enabled them to make nitric acid by the oxidation of ammonia. The same metal was used when the commercial plant was built. It has produced thousands of tons of nitric acid and is still in everyday use despite the severity of the service. During the interim, Republic has perfected many grades of ENDURO Stainless Steel—a steel to combat almost every type of corrosion.



FOR LONGER LIFE

When air conditioning was installed in this 13-story building, Toncan* Iron Pipe and Sheets were used to carry the cooling water and air. This alloy of refined open-hearth iron, copper and molybdenum was selected because of its high resistance to rust—its weldability—the ease with which sheets fabricate into ducts—and its economy.

There's a place in every plant and every building, projected or old enough for modernizing, where the staying power of Toncan Iron will save money for the owner. Used in equipment you make, it gives you another sales argument—longer life.



FOR FASTER PRODUCTION

The advantages of Republic Coiled Silicon Strip Steel are easily measured.

A transformer manufacturer found that from 217 pounds of electrical sheets he produced 7,224 laminations. Using the same weight of coiled strip he produced 8,130 laminations—a clear gain of 12½%.

But another advantage showed up in the test. When coiled strip was used, the hourly die-production jumped from 4,000 to 5,000 laminations—or 25%.

Republic Coiled Silicon Strip Steel enables manufacturers of electrical equipment to design for better electrical properties—faster production—and lower cost.

*Reg. U. S. Pat. Off.

REPUBLIC STEEL CORPORATION

REG. U. S. PAT. OFF.
REPUBLIC STEEL

GENERAL OFFICES · · CLEVELAND, OHIO

STEEL AND TUBES INC. · UNION DRAWN STEEL DIVISION · TRUSCON STEEL COMPANY
BERGER MANUFACTURING DIVISION · NILES STEEL PRODUCTS DIVISION

It eats glass— but it's tamed by Goodrich

A typical example of Goodrich product development

HYDROFLUORIC, mixed with nitric, is the "problem child" of acids — nothing would hold it satisfactorily — it even eats glass.

Virulent acids like this have been a major problem in modern industry where they are used hot, in cleaning stainless steel. Rubber tanks handle most acids perfectly but even rubber can't hold chromic, nitric, or mixed nitric and hydrofluoric. Other types of tanks cracked or were eaten away; wood tanks disintegrated and leaked dangerously.

Then Goodrich developed Koroseal —a synthetic with properties which begin where rubber leaves off. Koroseal was tested with every acid that rubber cannot handle — and withstands them all. It even holds aqua regia—the "king of liquids" which dissolves gold. Tanks lined with Koroseal are ending all breakage and leakage problems in chromium plating and stainless steel cleaning. Where other tanks would begin to leak in a few days and disintegrate in a few months, Koroseal tanks have been in use two years without a leak, without a sign of wear or a penny of expense.

Koroseal is a typical example of Goodrich research which is constantly developing new products to meet new needs, and improvements in standard products to make them last longer. All these developments are immediately applied to every product Goodrich makes — which explains why users report that Goodrich belting, hose, tanks, pipe and everything bearing the Goodrich name lasts longer, costs less, serves its purpose better. The B. F. Goodrich Company, Mechanical Rubber Goods Division, Akron, Ohio.

Goodrich

ALL *products problems* IN RUBBER

PURCHASING

Established 1915 as "The Purchasing Agent"
Consolidated with "The Executive Purchaser"

PURCHASING is an independent journal, not the official organ of any association. It is the only publication of national scope devoted exclusively to the interests and problems of the purchasing executive in industry and government.

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Long Distance

Long Distance telephone service gives you quick, personal contact with widely scattered sources of supply, at low cost.

The vice-president of a milling company says of Long Distance: "Every possible advantage must be taken of market conditions when purchasing our raw material, in order to keep our prices low and meet intensive competition. Thus the telephone has proved to be one of our most *economical* and *effective* methods of buying."

Long Distance is *direct*, *clear*, *conclusive*. Try it.

Yours on Request

Purchasing agents will find it well worth their while to read the publications reviewed on this and the following pages. From among the many submitted to us, they have been selected by the editors as having greatest interest and utility value to purchasing agents.

To obtain copies, simply fill in and mail coupon at the bottom of this page.

832. BOLTS, NUTS, SCREWS, RIVETS. Clark Bros. Bolt Co. has just issued a new and enlarged catalog and reference book No. 39. Comprising 90 pages, 6¼x9¼, it includes list prices, tables, and helpful information, fully illustrated and in color.

834. TOOLS and TOOL HOLDERS. A new general catalog No. C-39 of the Armstrong Bros. Tool Co. presents a comprehensive line of tool holders; carbon, chrome-vanadium and detachable head socket wrenches; C clamps; lathe and milling machine dogs; turret lathe and screw machine tools; ratchet drills; bits, blades and high speed steel; setting-up tools; machine shop specialties; and pipe tools.

836. LEAD PENCILS. To introduce their products, Reliance Pencil Corp. is offering free, a sample selection of 12 of the most popular types of wood cased lead pencils for office, factory and commercial use. Also available is an attractively illustrated catalog of the complete line of pencils, penholders and erasers manufactured by this company.

842. LEATHER CASES. A new catalog of the U. S. Leather Products Co. presents a complete line of hand luggage, leather goods and salesmen's cases, in standard and zipper models and in a variety of styles for business, school and professional use. The merchandising plan provides for individual purchases by employees through purchasing departments where the catalog is kept on file. 32 pages, printed in four colors, and illustrated with more than 200 cuts.

848. THIN PAPERS. When you know the correct grade of thin paper to specify for various office and factory uses, you'll save time and money and get better results. Valley Paper Company's "Thin Paper Efficiency Chart" which you can place under your desk glass or hang on the wall, gives you this complete information in a handy, easily-referred-to form.

849. WEIGHT CALCULATOR. For rapidly determining the weights of forged square, round, hexagonal and octagonal flats and bars, forged rings and blanks, the Kropp Forge Co. has prepared a handy calculator on the slide rule principle giving a direct reading, without computation. It is necessary only to know the dimensions of the forged shapes covered by the device, which is a helpful time saver for all uses of forgings.

850. UTILITY TOOL. "The Tool of a Thousand Uses" for pulling, pushing, spreading, bending and clamping, useful with spoked and plate center wheels, pulleys and gears, is shown in Bulletin P & P40 of Templeton, Kenly & Co., with numerous illustrations showing the tool at work in various typical applications.

PURCHASING, 205 East 42nd St., New York, N. Y.

I wish to receive the following literature:

Numbers: .....

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Company .....

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City .....**State** .....

852. WOVEN WIRE SCREENS. Catalog No. 82 of the Ludlow-Saylor Wire Co. is a complete treatise and reference book on wire cloth and woven wire screens in all grades and weaves, of all commercial metals and alloys, and for all purposes. Its 72 pages, conveniently assembled with plastic spiral binding, contain a wealth of information on the selection and characteristics of standard and special constructions, illustrations, and dimensional tables. Featured is Super-Loy, an economical steel for heavy-duty applications.

857. SAFETY EQUIPMENT. A comprehensive 106-page 8½"x11" loose-leaf catalog recently issued by Pulmosan Safety Equipment Co. covers virtually all industrial safety equipment requirements. Some of the numerous products illustrated and described are respirators of all types and for all purposes, hoods, helmets, masks, goggles, gloves, welding shields, safety ladder shoes, leggings, aprons, inhalators, fire-fighting equipment, first aid kits and supplies, safety shoes, foot guards, safety belts, salt tablets, etc.

858. SHIPPING CONTAINERS. In a 16-page booklet that is literally "packed with packaging ideas," the Hinde & Dauch Paper Co. illustrates and describes twelve typical examples of successful "profit packages" which are defined as "any container that helps to increase the sales of a product." The booklet is devoted to pointing out how attractive packages are important to good will and increased sale of merchandise.

863. CASTINGS. An attractive 24-page booklet which purposes to acquaint manufacturers with the company's facilities for producing castings of any size, shape or quantity, has been prepared by The Forest City Foundries Co. The booklet pictorially tells the story of the foundry, showing by means of actual photographs the operations in the making of castings.

864. TAPS AND DIES. A new and larger edition, comprised of 144 pages, is the new catalog just issued by Winter Brothers Co. Data on their complete line of taps, dies, and screw plates is given together with useful shop information and commercial standard tables frequently referred to by mechanics.

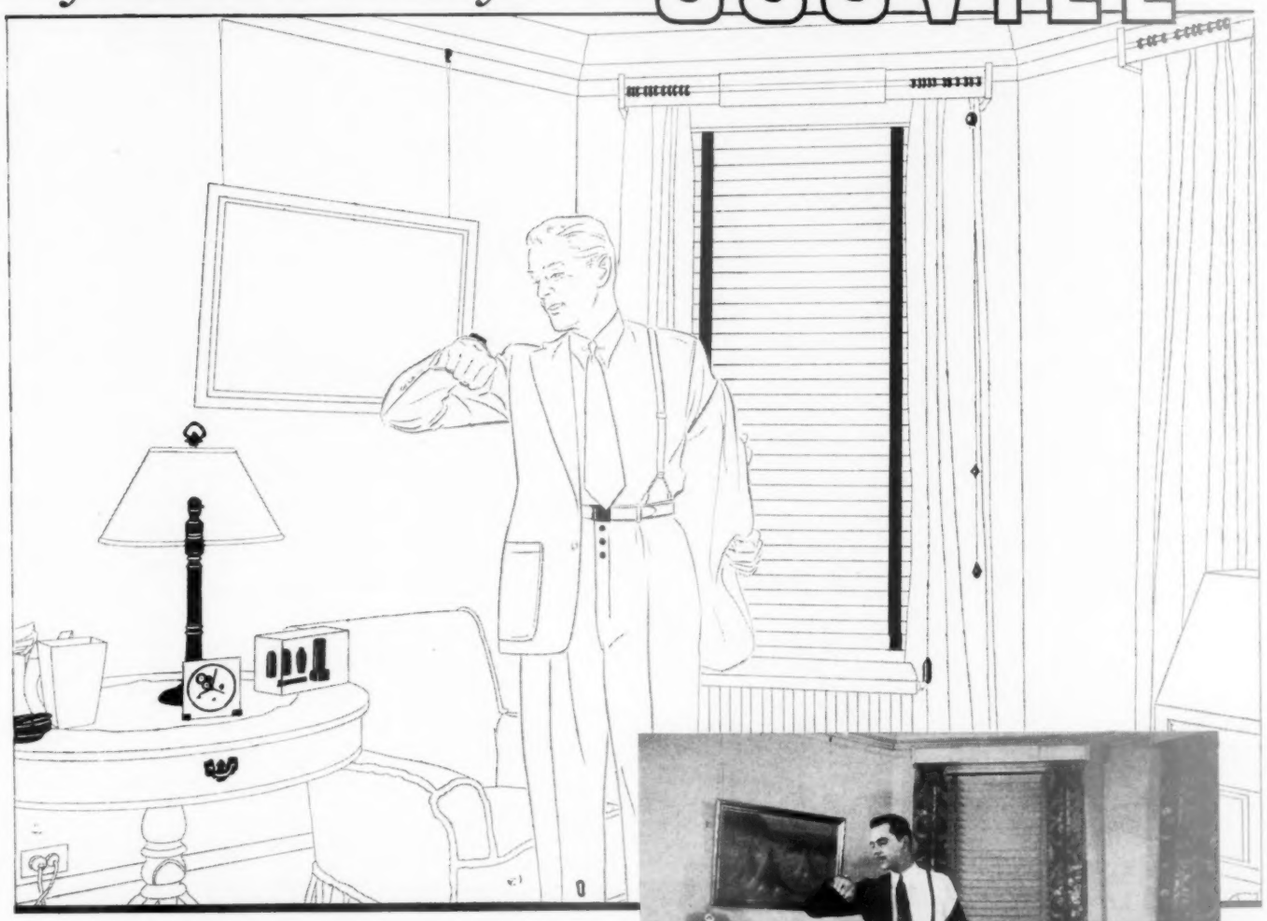
865. PRECISION GRINDER. Detailed information on a precision grinder for tools such as bits, dies, cams, bearings, screws, jigs, gun parts, etc., is found in a well illustrated folder just issued by The Dumore Company. This tool which is accurate to .0001", has many applications, several of which are illustrated. The many outstanding features of the grinder such as wick and tape thrower lubrication, spindle speeds from 6,600 to 38,500 r.p.m. and automatic belt adjustment are described in the interesting folder.

866. GUMMED TAPE. Unusually attractive, convenient and informative is the Central Paper Company's booklet, "Safetex—Geared to the Box," a handbook on gummed tape and its application. Mounted on plastic ring binders, with stiff cover to lie flat, the booklet has a colored and cut-tab index giving instant access to 12 concise and well illustrated sections.

870. SAFETY STEEL STAMPS. A new circular of the M. E. Cunningham Co. illustrates a variety of holders and interchangeable type for marking flat and curved metal surfaces, hot billets and slabs, cold billets, heavy castings and rolls, etc. The line is featured by design and analysis to provide safe and serviceable stamps, that will stand up under heavy duty without spalling or mushrooming.

(Additional listings on pages 8 and 10)

. . you'll live all day with SCOVILL



You'll live all day with metal or metal things that Scovill makes. There may be a half dozen or more in your bedroom—parts of the clock, radiator valves, the belt-buckle grip, the metal parts in your Venetian blinds, or "Grippers" on your shorts. They are in your razor, your plumbing, the toaster on your breakfast table, your car, your office-building elevator, your secretary's typewriter.

For thousands of small metal articles are made to order by Scovill as special products for sale only to manufacturers whose names appear on the products.

Many of them may be supplied by Scovill as "staple" goods—brass, bronze, or nickel silver—in sheet, rod, wire, or tubing—screw products—a wide variety of plumbers' brass goods—and so on. But often they are made to meet the individual requirements of the customer.

Small Articles

Many manufacturing concerns come to Scovill for their metal parts, rather than produce the items themselves. Scovill's engineering talent, and the variety and quantity of Scovill equipment frequently permit either a more satisfactory cost or a product betterment.

Use Scovill's products — and Scovill's facilities — to provide your metal parts quicker, better, and possibly more economically. Many of America's leading manufacturers do—and find it highly profitable.

More facts about Scovill's astonishing breadth of craft. Address . . . 42 Mill Street, Waterbury, Connecticut.

★

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Masters of Metal

SCOVILL MANUFACTURING COMPANY

WATERBURY, CONNECTICUT

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Yours on Request

Purchasing agents will find it well worth their while to read the publications reviewed on this and the following pages. From among the many submitted to us, they have been selected by the editors as having greatest interest and utility value to purchasing agents.

To obtain copies, simply fill in and mail coupon at the bottom of this page.

871. TESTING INSTRUMENTS. "Instruments for Testing Cement, Soils, and Petroleum and Its Products" is the title of a new 164-page catalog (No. PU-15) issued by the American Instrument Co. The first section covers testing apparatus for Portland cement, concrete, mortar, aggregates, lime, gypsum, etc.; the second section deals with testing the mechanical stability of soils, and includes latest developments in instruments used by civil engineers, and subgrade and road materials laboratories; the third section is devoted to the testing of crude and refined petroleum, greases, compounds, gasoline, naphtha, kerosene, bitumen, asphalt, pitch, tar, paraffine wax, creosote, etc.

872. AIR CONDITIONING. A 12-page pictorial booklet prepared by the Carbondale Division of Worthington Pump & Machinery Corp. shows typical installations of "Modern Air Conditioning for Theaters Around the World." The examples range geographically from New England and New York to Honolulu and Buenos Aires, and in size from 1,000 to 2,500 seat capacity. There are diagrams of typical layouts for theaters of the stadium and balcony types.

873. INDUSTRIAL FELTS. A revised Felt Application Chart is being distributed by the Booth Felt Co. Presented in convenient form, in standard file folder size, it shows actual samples of fourteen standard S.A.E. types of felts, hinged for easy inspection, correlated with a tabulation of the specific purposes for which each type is particularly adapted, greatly facilitating the selection of the correct grade and type.

874. STOP NUTS. The Elastic Stop Nut Corp. has issued a new catalog and data book. In its 56 pages the company explains the principle whereby the unit is locked to the bolt by action of a resilient non-metallic collar which eliminates thread play. It also contains comparative test data, suggested applications, illustrations of use, and a complete listing of standard nuts available.

875. ALUMINUM STAGES. A new folder of the Aluminum Ladder Co. describes safe and strong working stages for painters, construction and maintenance crews. Of ladder type design, combining light weight and rigidity, with full width Douglas Fir planking, the standard sizes range from 8 to 25 feet in length.

876. MATERIALS HANDLING. The new "Junior Catalog No. 639" of Barrett-Cravens Co., in 172 pages of "vest pocket" size, illustrates and describes 176 different materials handling devices, including lift trucks, portable elevators, container storage systems, and the new Barrett Torpedo electric hoists.

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877. EXPANSION JOINT. A revised, 12 page illustrated, descriptive Bulletin No. 35-15A has been issued by the American District Steam Co., on the ADSCO Piston-Ring Expansion Joint which can be completely unpacked and repacked under full operating pressure without shutting off steam or interrupting service.

878. GATE VALVES. A four-page circular, No. 311, is being released by Crane Co., describing its new line of 200 pound brass gate valves made with wedge disc, union bonnet and rising stem. Complete information is given on the valves, known as No. 422 and No. 423. They are identical except for the body, No. 422 having seats cast integral with the body and No. 423 having renewable body seat rings. The valves are intended for wide application, according to the circular, and are recommended for steam, water, oil or gas lines.

879. DISTRIBUTION TRANSFORMERS. R. E. Uptegraff Manufacturing Co. have just issued Bulletin No. 110 showing twenty illustrations of various types of Uptegraff Distribution Transformers, furnished in standard sizes up to 500 KVA, 25 or 60 cycles, single and three phase.

880. REFRACTORIES. A new book entitled "Boiler Refractories," which should be of value to every person in every industry where boilers are used, has just been published by the General Refractories Co. It contains chapters on Boiler Refractory Selection and Construction, Standards of the American Society of Testing Materials, and valuable tables for refractory use. It is printed in color and has over fifty illustrations.

881. TOOL MAKING. Carboloy Co., Inc., has issued a new bulletin (GT-116) entitled "How to Braze Carboloy Tools." By text and diagrams it describes the latest methods of torch brazing by which users can braze tips into tool shanks, gives suggestions as to materials required, shank and tip preparation, methods of cooling, designs for enclosed tips, and braze assemblies for special and multi-point tools.

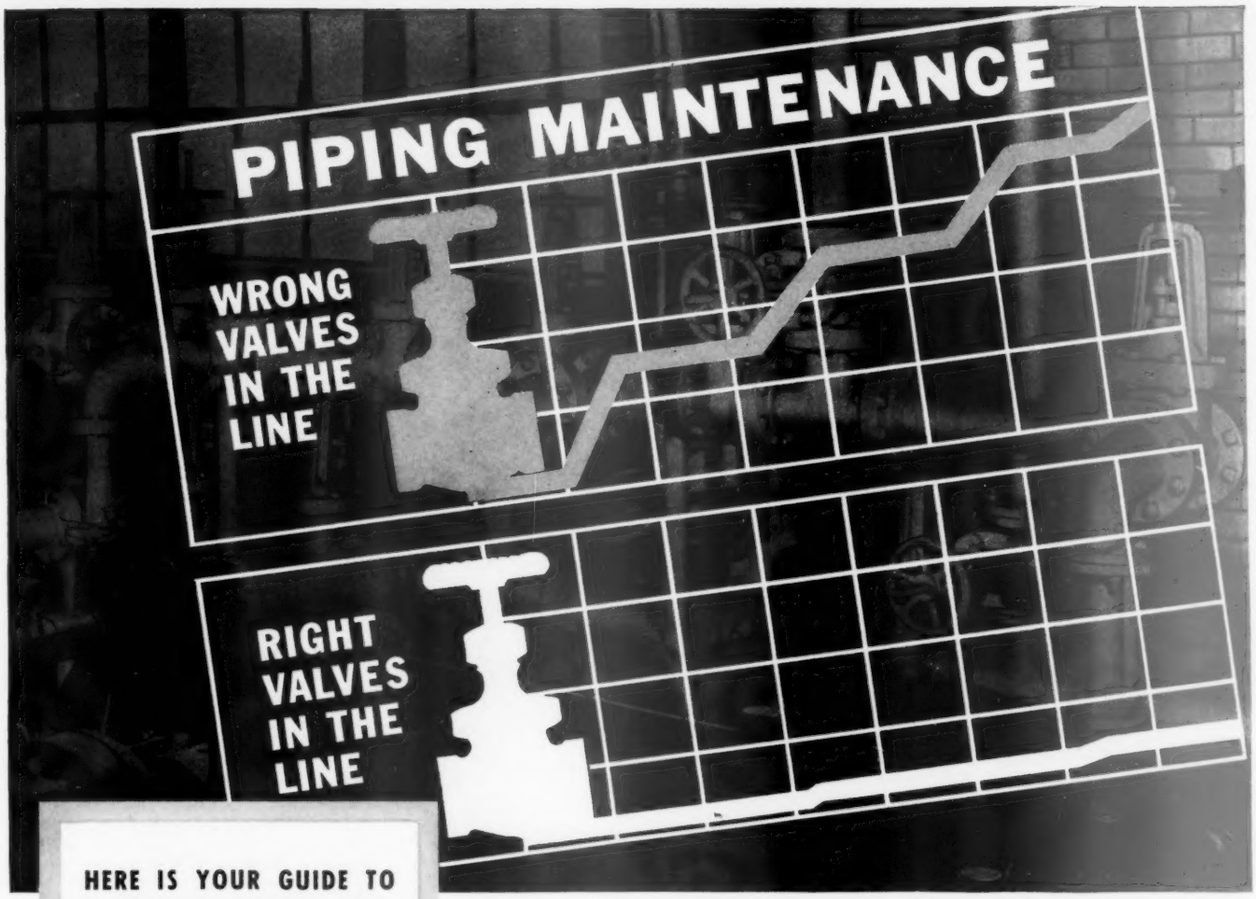
882. SOUND RECORDERS. Bulletins 16 and 17 of the Miles Reproducer Co. describe newly developed equipment for electrical filming of sound, useful for dictating, recording sales meetings, telephone conversations and the like. The device is simple, compact and portable, instantaneous in action, both recording and reproducing.

883. BOLTS, NUTS, RIVETS, RODS. Catalog No. 39 of the Pittsburgh Screw & Bolt Corp. is an attractively prepared and informative price list covering a comprehensive line of their products, with pertinent information and suggestions of value in ordering. Illustrated. 96 pages, spiral bound.

884. TANK FINISHES. How to obtain maximum results in painting interior and exterior surfaces on all types of tanks and supporting structures is explained in a new folder recently published by the American Asphalt Paint Co. A partial list of the topics covered includes: General instructions and surface preparations in applying tank finishes; how to paint metal, wood and concrete tanks, both interior and exterior surfaces; how to quickly estimate surface areas and amount of paint required on various size and style tanks and supporting structures.

885. THIN PAPERS. The use of thin, light-weight papers for letterheads, copies records, forms, and advertising literature can greatly reduce typing, mailing and filing expense. They are especially recommended in connection with air mail, branch office, and foreign correspondence. Samples and printed specimens are available from Esleeck Mfg. Co.

(Additional listings on pages 6 and 10)



HERE IS YOUR GUIDE TO PROPER VALVE SELECTION

Two basic valve types—gate and globe—are most commonly used in conveying industrial fluids and gases. Both types, in their many variations, are designed to give dependable flow control. Yet, each type has distinct features that may be an advantage or disadvantage in the efficiency of a given application. And that depends wholly upon the service conditions involved.

The Crane Bulletin—"Service Characteristics of Globe Valves and Gate Valves," with its Valve Selection Guide helps you avoid misapplication of valves. It shows you the way to low-cost valve maintenance. Get a copy from your Crane Representative — or, write for one today. There is no obligation.

YOUR PIPING COSTS STAY DOWN *when valves are properly chosen*

THE reason for this is simple. In the broad line of valves offered to industry today, there is one that is best suited to each specific application—one that exactly matches working conditions.

Perhaps service conditions in your lines vary slightly—do not appear important, or deserving of special attention. Yet economical valve performance begins only with proper valve selection; and every variable of service influences valve choice.

Perhaps individually, maintenance of your valves does not seem excessive, and is overlooked. But consider it in terms of all the valves in your plant—and in terms of operation interruptions. Your findings may be astonishing.

Because experience is the best means of gauging piping costs, Crane can help you keep them at a minimum. With a successful background in solving industry's piping problems, with unparalleled research and plant facilities, and with over 84 years of manufacturing skill, Crane has developed so complete a line of valves that every need of flow control can be filled with Crane-Quality equipment.

And because Crane-Quality is the result of extreme accuracy in manufacture, of careful analysis and specification of materials that go into each part, Crane valves assure the long, economical service that keeps piping costs down.

Backed by the Crane line of more than 38,000 piping items, your Crane Representative can help you solve your flow control problems. Call him today.

CRANE

CRANE CO., GENERAL OFFICES
836 S. MICHIGAN AVE., CHICAGO

VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS

Yours on Request

Purchasing agents will find it well worth their while to read the publications reviewed on this and the preceding pages. From among the many submitted to us, they have been selected by the editors as having greatest interest and utility value to purchasing agents.

To obtain copies, simply fill in and mail coupon at the bottom of this page.

886. EXPORT PACKING. To assist exporters in locating devices and methods of reinforcing all types of export packs, an informative 24-page booklet has been prepared by Acme Steel Co. This booklet describes ways for assuring safe arrival of shipments at foreign destinations and ways to prevent pilferage as well as damage claims. The first few pages are devoted to box strapping and some of the more popular of the 429 strapping tools and accessories in the Acme line. Several pages are devoted to the nail-on types of strapping which are recommended in those instances where inspection of shipments may be made en route. Strapping for bales, stitching wire for cartons, barbed box straps for crate corners and recoopering purposes as well as corrugated wood joint fasteners are other products described in the catalog.

887. RADIO EQUIPMENT. The 188-page Master Catalog of Radio Wire Television, Inc., for 1940 is now being distributed. Major sections include 40 pages of home, portable and auto radios and accessories; 35 pages of public address equipment; 50 pages of service equipment, parts and tools; and 30 pages for the television experimenter.

888. DIAMONDS. "How to Choose a Diamond," a booklet prepared by L. & C. Mayers Co., gives in concise form a great deal of important information to assist in the selection of diamonds.

889. METAL PARTS. The Scovill Mfg. Co. has issued a booklet entitled "Masters of Metal," an exceptionally interesting account of the company's enterprise in many industries related to metal, and outlining the facilities and services which are behind the fabrication of an almost infinite variety of metal parts.

890. SPRING SLIDE RULE. The William Gibson Co. is offering to persons responsible for the design or purchase of springs, a convenient calculator on the slide rule principle, computing torsional stresses, and indicating maximum loads, deflection under varying combinations of wire size, coil diameter, number of coils, etc. Useful in new design and in checking existing springs. A brief instruction booklet accompanies the rule.

891. GLUING TRANSPARENT SHEETINGS. Users of these relatively new materials of modern packaging will find many helpful points regarding their properties and handling in a new brochure prepared by the National Adhesives Division of National Starch Products, Inc. It covers the six principal types in general use today, with recommendations for the most effective adhesives under various conditions of use and application.

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892. DISCHARGERS. A bulletin on newly improved types of dischargers for centrifugals, has just been issued by the American Tool & Machine Co. It shows both the "shoe-on-curb" and the "hanging-in" types, as well as special dischargers for fume-proof-hooded centrifugals, and for imperforate horizontally baffled baskets, and a wide variety of plows and scrapers for various types of materials and processes.

893. LOCKS. The catalog of the Chicago Lock Co. presents a comprehensive line of locks for cabinets, furniture, files, meters, vending machines, garages, automobiles, radios, burglar alarms, and virtually every conceivable application.

894. FASTENERS. The Continental Screw Co. is distributing a new catalog showing Holtite screws, bolts and special parts for every industrial fastening job, furnished in standard slotted, cap and wing nut designs, or with the Phillips recessed head.

895. SAFETY CANS. Folder 131R of the Justrite Mfg. Co., 2061 Southport Ave., Chicago, Ill., presents a line of safety cans for flammable and explosive liquids, and oily waste cans, that reduce fire hazards and insurance costs while increasing shop efficiency.

896. SHADED POLE MOTORS. A new bulletin, No. F-8488, of the Westinghouse Electric & Mfg. Co. describes a series of shaded pole and companion A.C. or D.C. series wound motors of 1/125 to 1/30 horsepower, for unit heaters, fans, air conditioners, humidifiers, toasters, projectors and similar devices. Rotor and shaft are the only moving parts, with no brushes or internal switches to get out of order.

897. FLUORESCENT LAMP FIXTURES. Daybrite Lighting, Inc., announces Bulletin F-12, a 6-page folder introducing a variety of new wired units for one and two lights, 18 to 48 inches, representing various combinations of reflector shapes and finishes to fit a wide range of industrial applications such as deep or shallow windows, production and inspection operation, wall cases, and the like.

898. ELECTRIC DRILL. A new circular of the Speedway Mfg. Co., Cicero, Ill., describes a new ½-inch electric drill embodying many advanced design features. The improved natural grip thrust handle and smooth sliding thumb switch make it convenient and easy to use.

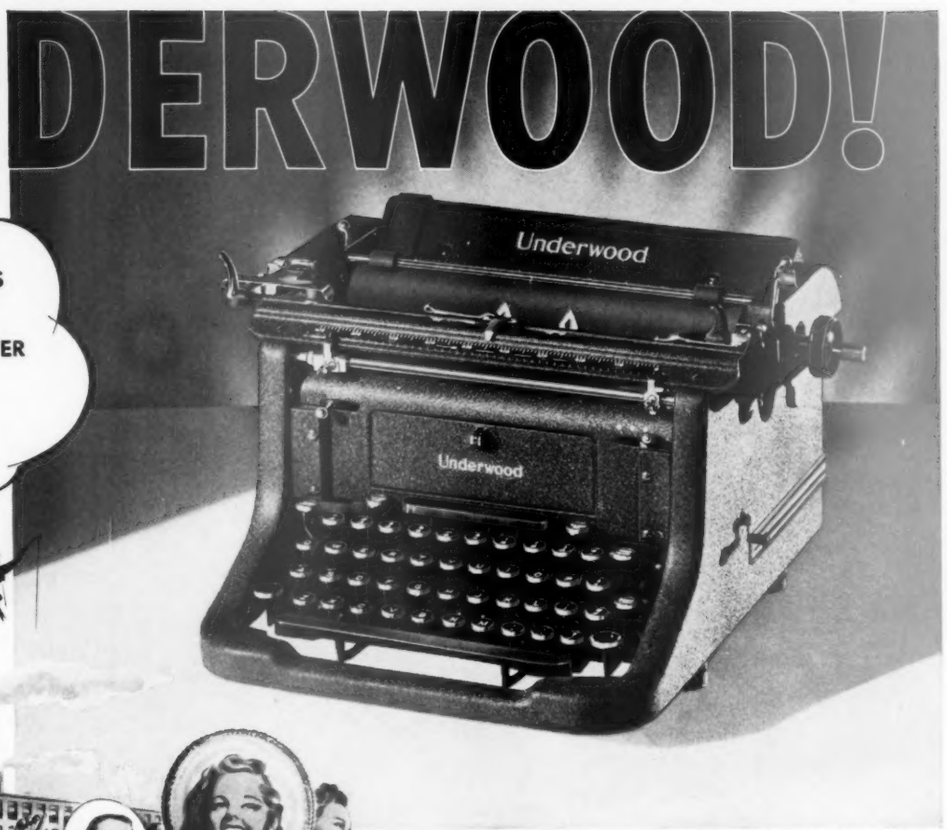
899. STEEL DESKS. A folder of the Automatic File & Index Co. announces a new line of steel desks incorporating a unique construction principle which permits easy interchangeability of desk pedestals at any time, in your own offices. All drawers are of extra depth and operate on ball bearing progressive slides. The line includes executive and secretarial models, complete in all finishes.

900. HOBBING. A practical discussion of all factors involved in the hobbing of gears, splines, etc., and including formulae and charts for use by the shop as well as engineering department, is provided in a new booklet just issued by Michigan Tool Co. The booklet covers such topics as: Setting up hobs, both for average as well as extreme precision work; figuring hobbing time; determination of causes of errors in the finished work; methods of calculating tooth modifications; eliminating of flats; designing hobs; cutting speeds; hob sharpening hints; checking hobs for lead and contour; use of centering gages; use of trial "dummies"; effect of hob and machine errors; use of multiple thread hobs; hob tolerances; etc.

(Additional listings on pages 6 and 8)

HARTFORD CELEBRATES 5 MILLIONTH UNDERWOOD!

WHISTLES BLOW, CROWDS CHEER AS UNDERWOOD REACHES THE HIGH-WATER MARK OF TYPEWRITER PRODUCTION



Underwood Master Serial No. 5,000,000

The Underwood Plant at Hartford, Conn.
Largest Typewriter Factory in the World

AT Hartford, Conn., on September 13, the shrill blast of factory whistles announced to all who could interpret their triumphant tones: "The 5 Millionth Standard Office-Size Underwood has just been born."

Five million Standard Underwoods! Back of that high-water mark figure, which does not include the enormous production of Underwood Portables, is a story of an organization that *marched on,* building, designing, creating during the Depression when there was such a great temptation to *mark time!*

Five million Standard Underwoods! In that figure is crystallized the net result of the Underwood policy of perpetual pioneering . . . of striving constantly in its great Laboratories to make the Underwood Typewriter a tool of ever increasing usefulness to American business!

And so the 5 Millionth Standard Underwood takes its rightful place in the Underwood Elliott Fisher Exhibit at the New York World's Fair where you are invited to inspect it. And, whether you are interested in operating typewriters or owning them, there is no better object lesson for determining your next typewriter choice than this—the 5 Millionth Standard Underwood!

VISIT THE UEF EXHIBIT AT THE NEW YORK WORLD'S FAIR BUSINESS SYSTEMS BUILDING

Typewriter Division
UNDERWOOD ELLIOTT FISHER COMPANY
Typewriters, Accounting Machines, Adding Machines, Carbon Paper, Ribbons and other Supplies
One Park Avenue, New York *Sales and Service Everywhere*
Underwood Elliott Fisher *Speeds the World's Business*

Copyright 1939, Underwood Elliott Fisher Company

You Should Inquire About This Offer

!!

From the number of inquiries being received from our clients and from buyers who have an interest in commodity price movements, we appreciate more than ever the importance of the analyses and forecasts being distributed by our organization — RIGHT NOW ! !

To be of the widest help possible, we are now making an offer to new subscribers whereby they virtually can receive our confidential reports for the rest of 1939 at no charge.

Why not inquire about this offer? Through it, you may be able to capitalize coming inevitable price movements to their fullest advantage. We invite your inquiry. No salesman will call. We will mail complete particulars.

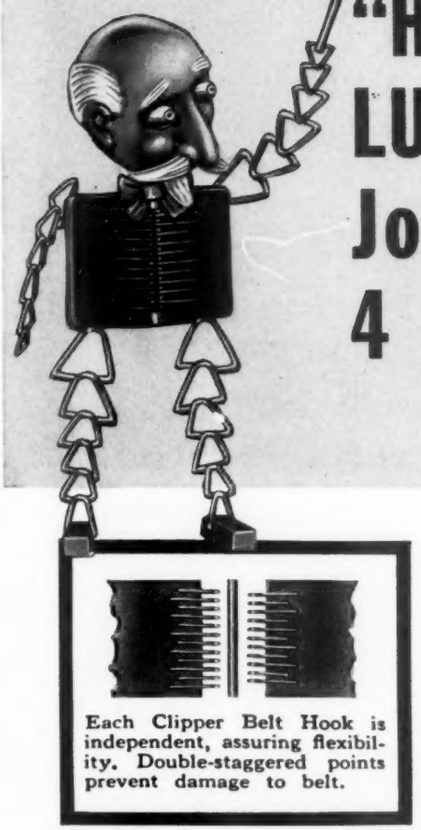
No cost or obligation involved

McGILL COMMODITY SERVICE - *Auburndale, Mass.*

EFFICIENT BUYING IS THE KEY TO PROFITS TODAY

"Here's proof that Clipper LUBRIHIDE Pins keep Belt Joints in Operation 2 to 4 Times Longer..."

—Says COL. CLIPPER



Each Clipper Belt Hook is independent, assuring flexibility. Double-staggered points prevent damage to belt.

Identical conditions. Both kinds of pins running in the same test★ belt at the same time. The rawhide pins are destroyed — Clipper LUBRIHIDE Pins hardly marked. Be sure your belts are joined with Clipper LUBRIHIDE Pins. Their BUILT-IN lubrication provides continuous frictionless oscillation, reducing fatigue strains on the hooks. The life of belt joints, consequently, is increased from 2 to 4 times . . . Order from your mill supply jobber today.

CLIPPER BELT LACER COMPANY • Grand Rapids, Michigan, U.S.A.

Copyright 1939, Clipper Belt Lacer Co.

PURCHASING AGENTS

. . . are buying

. . . are scanning new materials

. . . are actively seeking reliable sources of supply

The present business situation offers an exceptional opportunity to place your product and service before the attention of the men whose job it is to BUY

You can reach them directly in

PURCHASING

Since 1915 the national magazine for purchasing agents

205 East 42nd Street New York, N. Y.

"The Line of Lowest Ultimate Cost"

CARBON PAPERS INKED RIBBONS

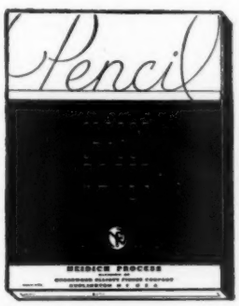
FORTY YEARS OF EXPERIENCE in the production of **QUALITY CARBON PAPERS AND INKED RIBBONS** is the basis of the **"PLUS REQUIREMENTS"** of The Neidich Line. **OUR TRAINED FIELD REPRESENTATIVES,** experienced in solving machine requirements, will serve you. **USE THEM TO YOUR ADVANTAGE.**

UNLOAD YOUR PROBLEMS ON THE NEIDICH SALESMEN

Scientific handling of carbon and ribbon applications is our function.

We have **A CARBON PAPER FOR EVERY NEED OF MANIFOLDING,** Clearness of impression, legibility, and durability are built into these papers. We have **A RIBBON FOR EVERY REQUIREMENT OF TYPE IMPRESSION AND TYPE BLOW.** Sharpness, wear, and permanence are our standards.

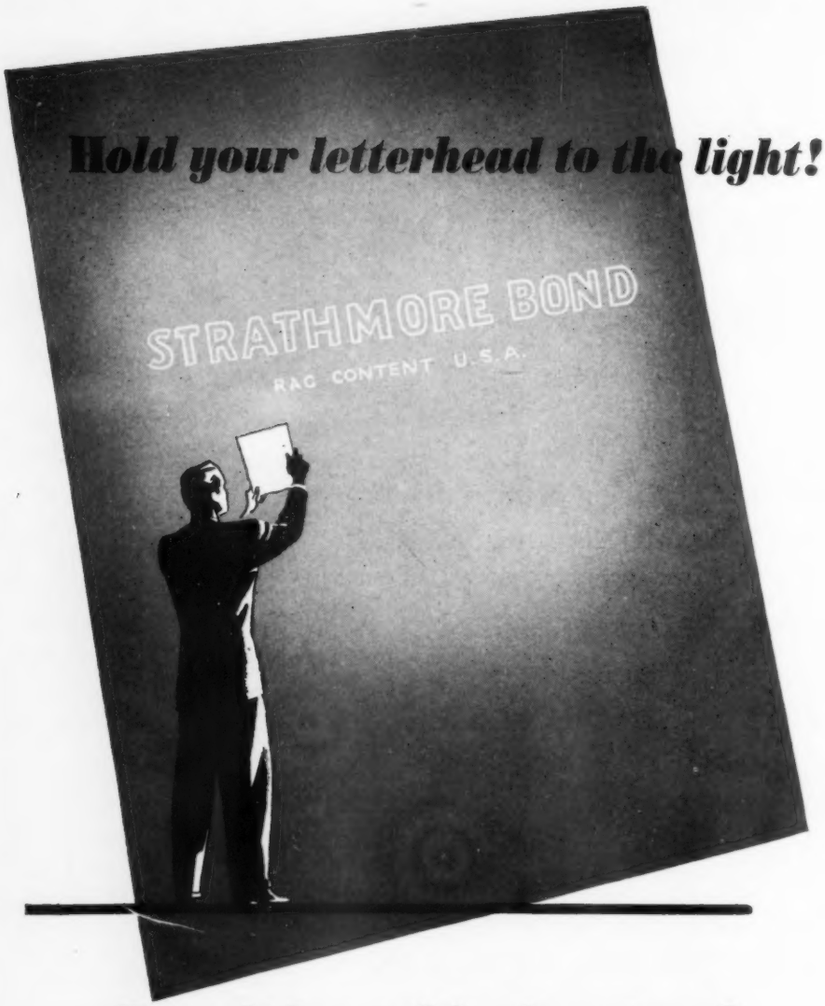
Let us prove that ours is **"THE LINE OF LOWEST ULTIMATE COST."** Drop us a line and **HAVE OUR CARBON AND RIBBON SPECIALISTS PROVE THIS TO YOUR SATISFACTION.**



NEIDICH PROCESS

DIVISION OF UNDERWOOD ELLIOTT FISHER COMPANY

BURLINGTON, NEW JERSEY



Does it bear this signature?

The Strathmore watermark, in every sheet of STRATHMORE BOND, stands for character in paper making...for fine letterheads with impressive, expressive qualities of texture and surface. A letter written on STRATHMORE BOND costs less than 1% more than the same letter written on the cheapest paper you might buy. And when you use STRATHMORE PARCHMENT, as fine a paper as can be made, the letter costs only 2.9% more. Such extra effectiveness, for so little difference in cost, is sound business economy.

THE STRATHMORE BUSINESS PERSONALITY CHECK LIST shows all the ways in which a business is seen and judged by its public, gives all the *appearance factors* important to *your* business. Write on your business letterhead for this check list. Dept. P.H. 8, STRATHMORE PAPER COMPANY, WEST SPRINGFIELD, MASSACHUSETTS.

STRATHMORE *MAKERS OF FINE PAPERS*

STANDARDIZE ON STRATHMORE BOND

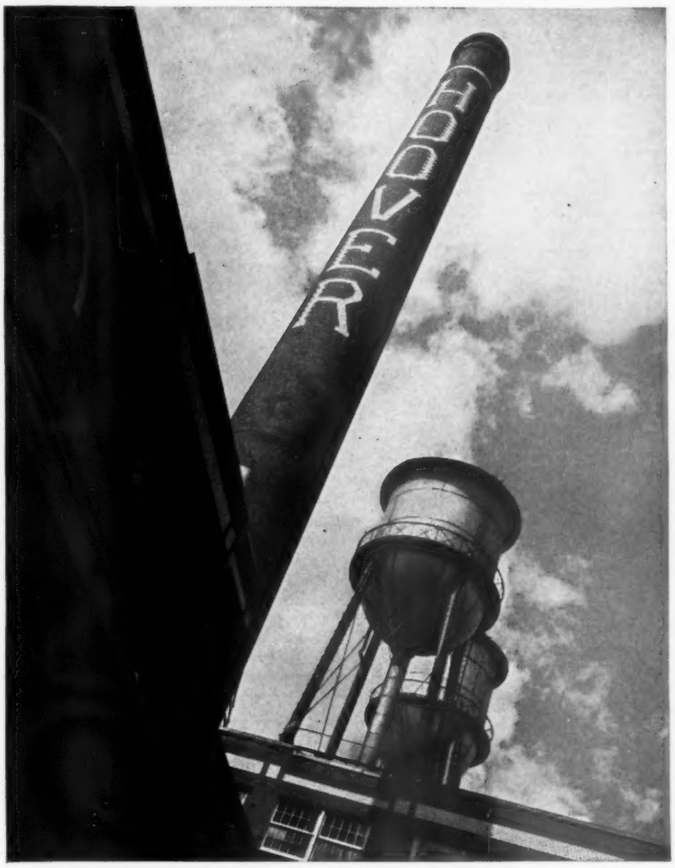
When you specify STRATHMORE BOND for a letterhead, you know you will get a quality paper...with a really fine reputation...at a moderate cost. STRATHMORE BOND means value. Value to your business because it makes a fine letterhead. Value, too, because it keeps the budget down.

Business executives know the Strathmore reputation. And Strathmore advertisements like this prove the value of that reputation, by pointing out how big business firms do Standardize on STRATHMORE BOND.

This series appears in:

FORTUNE
TIME
BUSINESS WEEK
NEWSWEEK
ADVERTISING & SELLING
PRINTERS' INK MONTHLY
SALES MANAGEMENT
TIDE

K & M INSULATION HELPS STEP UP EFFICIENCY INSIDE THIS MODERN PLANT



HOOVER VACUUM CLEANERS

High efficiency is the keynote of such modern plants as that of The Hoover Company of North Canton, Ohio, Manufacturer of The Hoover Electric Cleaner. As a result, it is not surprising that the heat insulations used in this plant are made by Keasbey & Mattison—a company known throughout the nation as a leading authority on problems of heat conservation and control.

Established more than 65 years ago, the Keasbey & Mattison Company pioneered in the development of Asbestos and Magnesia products, originating many of the most efficient forms of insulation in widespread use today.

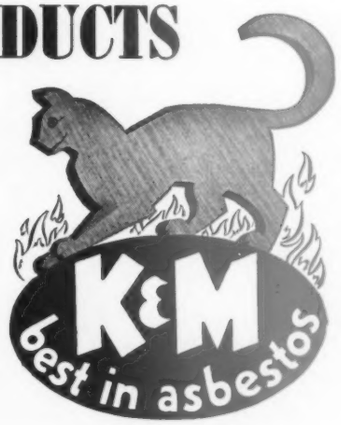
Because of their superior properties, K & M products brought new economies to countless industries, and this Company rapidly grew to a national institution with nation-wide facilities. Today, Keasbey & Mattison is one of the manufacturing leaders of America. Distributors' warehouses are strategically located throughout the country for quick service.

K&M

ASBESTOS AND MAGNESIA PRODUCTS

KEASBEY & MATTISON

COMPANY, AMBLER, PENNSYLVANIA



Keasbey & Mattison's long experience in providing industrial plants with high efficiency heat insulation for specific conditions has kept us closely in touch with the problems of the buyer. The policies of K & M Distributors are co-ordinated with those of this Company to insure your maximum satisfaction. Emphasis is placed upon a constructive insulation service to meet your needs, in which the high quality of K & M materials plays an essential part. For dependable products and intelligent service, you can rely upon K & M Distributors.

TRY THIS CASE

WITHOUT COST — IN YOUR OWN OFFICE!

MAKE "typing costs" the defendant. You be the judge. Right in your own office, let Columbia produce facts to prove whether or not you should be getting better ribbon and carbon performance at a lower figure.

Research regarding the requirements of many firms — experience gained in serving them—have provided Columbia with countless case histories in low-cost typing. The evidence thus gathered proves conclusively that the real value of typewriter ribbons and carbons lies not in low purchase price but in high-efficiency *performance*—and only an analysis of *your* requirements can decide the kind of ribbons and carbon papers *you* should buy.

Write or call the Columbia office nearest you to find out how typewriter ribbons and carbon papers can give you the utmost in

Length of Service *Clarity of Write*
Legibility of Results
Suitability for the Work Required
Lowest Possible Efficiency Cost

COLUMBIA
RIBBON & CARBON MANUFACTURING CO., *Inc.*
Main Office and Factory
Glen Cove, L. I. New York

BRANCHES { New York, Chicago, Philadelphia, Pittsburgh, Cincinnati, Nashville, New Orleans, Kansas City, Milwaukee, Minneapolis.

—also—

LONDON, ENGLAND — MILAN, ITALY — SYDNEY, AUSTRALIA

Mail

What's All That Noise About?

TO THE EDITOR:

The current editorial controversy on "Worth Less Than Nothing"* creates more interest than it merits. Like many earlier editorials, such as "Penny-Pinching Purchasing Agents," etc., the statements are based either on ignorance or on premeditated selfishness.

When a person claiming to know the A.B.C.'s of modern industrial organization and management goes off the deep end by indicting universally-accepted functions and procedure, one must wonder what is behind it, and one can find out if one looks around a wee bit.

Now and then some new or little known publication takes a running jump at all purchasing agents while under the delusion that industry handles its purchasing as the retail merchandise store does. There the buyer also handles sales and, necessarily, becomes somewhat dictatorial because the style, price, quality and salability of the merchandise are all wrapped up in the purchase transaction. Industry does not operate that way. It has specialists directing the various departments and they, also necessarily, must have their activities co-ordinated by the top management. Square pegs which jam the works don't last very long, for the specialists in production, accounting, sales, engineering and purchasing must be a smooth-working and co-operative profit-making machine.

Any other setup would be silly, and you never hear any questioning of the soundness and efficiency of our specialized departmental functioning from an experienced and active industrial executive. Do you know of a single top-flight industrial executive who believes any of the recognized divisions of his organization is useless or ignorant?

Direction vs. Leadership

Then why does an editor step in with such an inference? It's either one or the other reason given up front, and in the case of a publisher of leading engineering publications it could hardly be ignorance. No, they have able editors who know better but who get editorial direction from above and camouflage it to represent editorial opinion and, they hope, leadership.

Then, why? Well, that's easy to answer for you need only look for a motive, and there it is. It is a well known fact that advertising income is the principal income and objective of most publications. Subscriptions rarely pay for the bookkeeping and the cost of securing them. Many publications gladly pay solicitors the entire subscription. So, advertising income is essential; it's the life blood of a commercial publication, and the editor who is not influenced by the wishes of advertisers and the promotional efforts of his own advertising solicitors is a rare bird.

The advertising solicitor must convince the prospect that the people who read that publication are prospective customers. To do otherwise would be like offering bathing suits to the Eskimos.

For a number of years the publication business was very profitable; as a result, there is a publication for almost any purpose, policy, function, profession or trade you can mention. They are in business to make money, and don't let any altruistic motto or editorial kid you. To make money they must secure advertising and to do that they develop surveys, editorials and sales talks to convince advertising space buyers that the men their particular publications reach are the ones who specify or purchase the products being advertised.

It's An Art

You can't blame them; it's an art if done successfully—and it is done in large figures. Of course, the space buyer who falls for it definitely dates himself; he has not been in touch with the developments in industrial organizations. It has been many years since the pretzel factories permitted the benders or the packers to specify or purchase the materials or machines. Of course the benders and the tasters and the packers, bookkeepers, et. al., are all consulted and their expert and practical information makes it possible for the purchasing department to see through the kind of cockeyed sales talk some advertising buyers must apparently fall for. The decisions of each of those departmental executives is likewise influenced by others; so why not present your product in the "Ladies' Home Designer" in order to reach all of them?

Every executive in the organization that is worth his salt has some influence on every other division of that organization. Of the purchasing department that is especially true, but I don't know any office where a conference of the principal executives must meet to determine what soap, paper, belt, steel, oil, etc. should be purchased. The producers of these generally-used items are a representative group of business houses and ordinarily a thousand dollars worth of research and technical investigation is not necessary to choose between their products. The purchasing department can secure it when necessary, and on capital investments does so, but if the purchasing department followed the procedure some advertising salesmen (and editors) seem to think is necessary—of bothering other important divisions about the selection of every item to be purchased—it would get the cryptic answer "What are you here for?" I wonder what those big word manipulators in editorial jobs think the purchasing department does —run the engineering department?

G. A. RENARD,
Executive Secretary-Treasurer
National Association of
Purchasing Agents
New York, N. Y.
September 29, 1939.

* "Product Engineering," August, 1939.

TO THE EDITOR:

The attitude taken by you regarding the published article on criticism set up against the purchasing profession should receive the compliments of the purchasing men all over the country. The purchasing profession for the last several years, and the men holding these positions, are being recognized for their ability in bringing new items to, as well as saving money for their companies, and for assisting the engineering department. I am sure that the majority of companies, where cooperation is necessary for the benefit of the management, would find there is no dissension or antagonism caused or created either by the purchasing agent or the engineering staff. A critical condition is emanated where either the engineering department or the purchasing men take sole initiative in specifying and purchasing items without consultation.

In the majority of companies today, it is my privilege to know that the buyers are trained in their profession. In many cases you will find purchasing men are engineers, or with technical backgrounds, and capable of talking with ability on the items they purchase. Everyone realizes that it is impossible to have complete information on all items, and when these questions are brought to the attention of the purchasing department, they generally refer them to the man who is more capable to answer the questions intelligently.

The man who criticized purchasing, in my estimation, has little understanding of the actual operation of a good purchasing department, or he encountered a very bad experience with some purchasing department. But this should not incriminate the entire purchasing profession.

S. M. McCALL
Purchasing Agent
Hummer Mfg. Co.

Springfield, Ill.
September 29, 1939

TO THE EDITOR:

I think you have taken a very excellent stand, which I am sure the profession at large will appreciate very highly.

A. CLOHOSEY
Purchasing Agent
Westinghouse Electric & Mfg. Co.
Lamp Division

Bloomfield, N. J.
September 26, 1939

TO THE EDITOR:

Your masthead editorial is full of fire and fight and the kind of stuff I like. I hope you will go through far enough to make certain that the challenge will acquit purchasing agents of the unfair stigma that some so-called professionals cling to. Fortunately, there is nothing of the sort in the Prudential organization.

J. R. BOYLE
Purchasing Agent
The Prudential Insurance Co. of America

Newark, N. J.
September 25, 1939

The next advertisement in this series will appear in Purchasing in November

The Right Way To Hoist a Load

● Industrial loads must be lifted rapidly, safely and economically. The hoist that performs this service faithfully is a favorite in industry.

That is why, year after year, more Wright Hoists are going into use at lifting operations of all kinds. They have earned recognition by long and faithful service.

Each Wright Hoist embodies 21 definite points of superiority. There is zinc coating which prevents corrosion. There is a safety guard for the load chain that makes it impossible for the chain to ride out of the pocket, regardless of position. There are precision load wheel bearings that assure fast, smooth, positive action. There are 18 other important advantages that go to make every Wright Hoist, from ¼-ton to 40-ton capacity, a safe and economical tool for industry.

Wright quality typifies the quality of each of ACCO's 137 "Pedigreed Products."

See our exhibit in the Metals (Products) Building, Opposite the Perisphere and Trylon, New York World's Fair

AMERICAN CHAIN & CABLE COMPANY, Inc.

BRIDGEPORT • CONNECTICUT

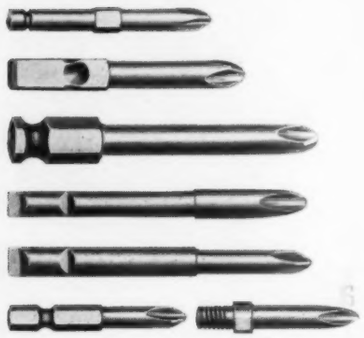
AMERICAN CHAIN DIVISION • AMERICAN CABLE DIVISION • ANDREW C. CAMPBELL DIVISION • FORD CHAIN BLOCK DIVISION • HAZARD WIRE ROPE DIVISION • HIGHLAND IRON AND STEEL DIVISION MANLEY MANUFACTURING DIVISION • OWEN SILENT SPRING COMPANY, INC. • PAGE STEEL AND WIRE DIVISION • READING-PRATT & CADY DIVISION • READING STEEL CASTING DIVISION • WRIGHT MANUFACTURING DIVISION • IN CANADA: DOMINION CHAIN COMPANY, LTD. • IN ENGLAND: BRITISH WIRE PRODUCTS, LTD. • THE PARSONS CHAIN COMPANY, LTD. *In Business for Your Safety*

APEX

POWER BITS ⊕ HAND DRIVERS
for Phillips and Slotted Screws ⊖ General Purpose and Super Service for Phillips Screws

LOWER TOOL COSTS are a certainty when you use APEX Bits

POWER BITS



and here's why:

They are made of a special shock-resisting steel, heat-treated to give maximum hardness, toughness and wear resistance. Special tempered bits for self-tapping and case-hardened screws. For best results, specify type of screw used when ordering.

Power Bits for Phillips or Slotted Head screws—all types, all sizes—to fit all makes of electric, air and spiral drivers.

HAND DRIVERS

Hand screw drivers for Phillips Screws *only:* General Purpose types for ordinary usage and the Super type for case hardened and self-tapping screws.

Immediate Delivery

And, you can get immediate delivery on standard Bits and Hand Drivers.

Reconditioning Service

Don't overlook this economy on Apex-Phillips Power Bits: when worn out, you can return them for reconditioning at a very substantial saving.

Write for Your Copy of Manual No. 11

Phillips License No. 2

Patents Nos. 2046837-38-40

The APEX MACHINE & TOOL Co.
Dayton, Ohio

TO THE EDITOR:

When I received the September issue of PURCHASING, as is my custom I read it thoroughly. One of the first things I noticed was your editorial comment regarding an article published by Product Engineering. It filled me with two emotions.

One was to write a letter to Product Engineering and tell them what I thought, based on better than twenty-five years experience in purchasing.

The other emotion was the satisfaction in knowing that somebody had the fortitude to challenge the efforts of some people to make the world believe that good management will tolerate back-door methods.

OTTO A. DWORAK
Purchasing Agent
Curtiss Aeroplane Division
Curtiss-Wright Corp.
Buffalo, N. Y.
October 2, 1939

TO THE EDITOR:

It is evident that some education is still necessary to convince some so-called executives that purchasing is not a department trying to work against the interests of a specification, engineering or operating department. Barring, of course, the familiar and over-emphasized example to which you referred. That evidently is a question of education, and should not develop into an argument.

LEE BUSSMANN
Purchasing Agent
Bussmann Mfg. Co.
St. Louis, Mo.
September 25, 1939

TO THE EDITOR:

Your editorial on page 21 is extremely interesting. I have often tried to figure out why management builds up with one hand and tears down with the other.

M. C. RIDER
Purchasing Agent
Wilson Products, Inc.
Reading, Pa.
September 26, 1939

TO THE EDITOR:

Accept my congratulations on your splendid editorial on page 21.

CARL A. ILGENFRITZ
Manager of Purchases
and Raw Materials
Republic Steel Corp.
Cleveland, Ohio
September 29, 1939

TO THE EDITOR:

I doubt if it is advisable to waste time arguing with an article such as you refer to. I really believe we lose dignity in taking notice of it.

J. P. SANGER
Vice-President in Charge
of Purchases
United State Gypsum Co.
Chicago, Ill.
September 27, 1939

OF A NEW FASTENING METHOD THAT CUTS ASSEMBLY COSTS AN AVERAGE OF 50%

Let's get inside the recess of a Phillips Screw and find out how thousands of manufacturers save money by using Phillips Screws.

- **QUICKER ASSEMBLY**
  Note the many surfaces where driver contacts recess. More driving power results — an easier, quicker job.
- **NO BURRS TO REMOVE**
  Observe the *flat* surfaces. No curves except at the rim. That — together with the close fit — prevents burrs.
- **NO SPLIT HEADS**
  It took thousands of experiments to determine the angle of taper utilizing maximum turning power without sacrificing strength.
- **REFINISHING COSTS SAVED**
  The recess keeps the driver from slipping. This saves accidents and refinishing costs. Faster driving is perfectly safe.
- **PERFECT BALANCE — DRIVER AND SCREW SIZES**
  The driver should fill the recess to the outer edge — otherwise, turning action is limited by driver size. Or, if the driver is too large, you're apt to strip the fibre structure of wood or metal. That's why we have four sizes Phillips Drivers to cover all screw sizes (half as many as for slotted screws). Two drivers handle sizes #5 to #16 (85% of all screws).

Try Phillips Screws in your plant. See how they cling to driver . . . drive straight automatically . . . drive home with much less effort . . . provide much stronger assembly.

PHILLIPS RECESSED HEAD SCREWS

MACHINE SCREWS · SHEET METAL SCREWS · WOOD SCREWS · STOVE BOLTS

This booklet will help your plant cut fastening costs and improve assemblies.

Address one of the firms below for free copy.

U. S. Patents on Product and Methods Nos. 2,046,343; 2,046,837; 2,046,839; 2,046,840; 2,082,085; 2,084,678; 2,084,079; 2,090,338. Other Domestic and Foreign Patents Allowed and Pending.

American Screw Co., Licensor, Providence, R. I.
Chandler Products Company, Euclid, Ohio
Continental Screw Co., New Bedford, Mass.
Corbin Screw Corporation, New Britain, Conn.
The Lamson & Sessions Co., Cleveland, Ohio
National Screw & Mfg. Co., Cleveland, Ohio
Parker-Kalon Corporation, New York, N. Y.
Pheoll Manufacturing Company, Chicago, Illinois
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N.Y.
Scovill Manufacturing Co., Waterbury, Conn.
Shakeprcof Lock Washer Co., Chicago, Ill.

IT COSTS LESS TO USE PHILLIPS SCREWS

To The Moon and Back!

● If all the corrugated board produced by The Stein-Hall Process since its introduction in 1935 had been made up into standard-construction boxes measuring 12x12x12 inches and piled top to bottom they would reach from the Earth to the Moon *and back* — a distance of approximately 478,000 miles. That's a lot of board—certainly enough to prove the superiority of this Process.

CERTIFIED!

This is to certify that I have audited the books of Stein, Hall Mfg. Co. and certify to the accuracy of the above statement.

D. P. Bourke
AUDITOR

Subscribed and sworn to before me this 29th day of August, A. D. 1939.

L. G. Serna
NOTARY PUBLIC

THE STEIN-HALL PROCESS

CORN PRODUCTS REFINING CO.
17 Battery Place, New York City

CLINTON COMPANY
Clinton, Iowa

PENICK & FORD, LTD., INC.
420 Lexington Ave., New York City

STEIN, HALL MFG. CO.
2841 S. Ashland Ave., Chicago

A. E. STALEY MFG. CO.
Decatur, Illinois

STEIN, HALL & CO., INC.
285 Madison Ave., New York City

DECIDE HOW MANY » » WE'LL SHIP

Greater facilities—one of the most modern plants in America—and a highly specialized production—these assure our customers of prompt service on their cap and set screw requirements. More than 30 million pieces are stocked for immediate delivery from our four warehouses and the factory—all fresh new stock made by the Kaufman Process *patented,* our own plant development. Specify these better cap screws for faster assemblies
THE CLEVELAND CAP SCREW COMPANY, 2923 East 79th Street, Cleveland, Ohio.

CLEVELAND CAP SCREWS

SET SCREWS • BOLTS AND NUTS

Address the Factory or our Nearest Warehouse: Chicago, 726 W. Washington Blvd. • Philadelphia, 12th & Olive Streets
New York, 47 Murray Street • Los Angeles, 1015 E. 16th Street

Uniform Results . . . Lower Costs with Ryerson Certified Alloys

You can reduce failures—eliminate spoilage and get better results in less time with Ryerson Certified Alloy Steels. They are from selected heats of steel that meet an ideal specification—a "specification within a specification"—that assures uniform response to heat treatment.

All Ryerson Certified Alloys are analyzed and tested in advance. Special data sheets showing exact chemical analysis, grain size, cleanliness rating, and results of actual heat treatment tests, are prepared and sent with every shipment. You know exactly what you are getting. Your heat treater does not have to test. He takes no chances. Spoilage is eliminated and sound dependable jobs of high accuracy and uniformity are secured.

Ryerson has large and complete stocks of these selected identified alloy steels. They cost no more and quick shipment is assured.

Ryerson Certified Steels also include carbon, tool and stainless steels that meet definite quality standards. They offer many advantages to steel users. Let us tell you the complete story. Write for booklet.

RYERSON *Certified* **STEELS**

Joseph T. Ryerson & Son, Inc. Plants at: Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

RYERSON CERTIFIED STEELS

Principal products in stock for Immediate Shipment include—Bars, Structurals, Plates, Iron and Steel Sheets, Tubing, Shafting, Strip Steel, Alloy Steels, Tool Steels, Stainless, Babbitt, Welding Rod, etc.

Scarcity or Scare?

AFTER a decade of operations and markets based on the economics of surplus supplies and production facilities in virtually every commodity, the national psychology has changed overnight to the assumption of scarcity. That assumption is not well founded except in the case of supplies of foreign origin, where difficulties in transportation and the imposition of export embargoes have actually cut off deliveries. These exceptions are important, but they do not rationally explain the panicky buying and perpendicular price advances on many domestic materials in the past month.

It was only three months ago that textile mills sealed 25% of their spindles, zinc producers were bitterly protesting imports of foreign metal, and the government was cautiously trying to unload a portion of its large holdings of cotton and naval stores on a sluggish market. It is only a month since the petroleum industry cut production in half. Those stocks and facilities still exist. Even the greatly improved operating rates in steel and other industries are still substantially under rated capacity.

Naturally it takes some time to gear production to a rapidly rising demand—to reopen mines, recondition idle equipment, relight furnaces, and restaff factories. But the urgency for immediate material reflects either an inadequate inventory and maintenance policy, or the desire to speculate in commodities, or outright panicky thinking.

So far as authentic reports are available, organized purchasing in industry has not followed these courses. Inventories and coverage have been reasonably extended, buying volume is up in proportion to higher operating schedules, and profiteering has been pretty much confined to retail consumer channels.

Higher production and employment are wholly desirable. Price advances to cover rising costs and to adjust inadequate manufacturing margins will not be questioned or resisted. Protection of inventory values will tend to sustain any reasonable advance, though with short consideration for the speculator. But excesses now will mean another period of write-offs and shut-downs. Now, more than ever, the purchasing agent must be a sound judge of real values in the materials that he buys. And more than ever, a sound business relationship with his suppliers will prove an asset of utmost importance to his company.

Stuart F. Heinritz

Pen-Points on Purchase Law

HELLO, MR. ROEN. I WANT TO ASK YOU A QUESTION OR TWO WHEN I WAS IN NEW YORK THE LAST TIME I BOUGHT $350 OF BURLAP BAGS. WE'RE HAVING A DISAGREEMENT NOW ABOUT THE PRICE AND TERMS.
PURCHASING AGE
YOU SAY YOU HAVE NO PURCHASE ORDER OR OTHER WRITING OR CORRESPONDENCE SHOWING THE EXACT AGREEMENT?
THAT'S RIGHT.
RICHARD ROEN
ATTORNE
AT
LAW
HOW WERE THE GOODS SHIPPED?
F.O.B. NEW YORK CITY.
IT LOOKS LIKE NEW YORK WAS THE PLACE OF CONTRACT. DOWN THERE YOU CAN'T PROVE THE SALE UNLESS YOU HAVE A WRITTEN MEMORANDUM OF IT. MAYBE YOU CAN GET ONE YET.

ACCORDING to the Statute of Frauds certain contracts must be in writing in order to be enforceable by action. The section of the Statute applicable to the type of case pictured above provides that an oral sale of personal property over a stated amount cannot be enforced, unless part payment is made or part of the goods accepted by the buyer.

Some version of this section is in force in most states. The stated amount, however, varies widely. In New York, for example, it is $50.00; in Massachusetts, $500; in Ohio, $2,500. Contracts for "work and labor" are not included.

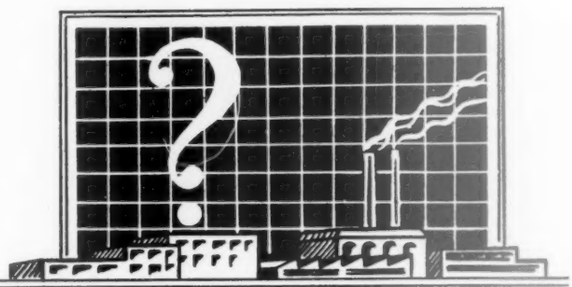
No particular form of writing is required. It may be formal or informal. Invoices, order blanks, letters, or telegrams may be sufficient if carrying sufficient reference to the subject matter, the parties, and an authenticating signature of the party to be charged, or his agent. The customary purchase order ordinarily is sufficient to bind the purchasing agent. Such a case as the one above illustrates the importance of this document.

The Statute is usually construed as a rule requiring a certain kind of proof. To omit the writing, therefore, does not make the contract invalid; just unenforceable. Since the states differ in the amounts above which oral sales of personal property will not be enforced, a contract might be enforceable in one state without a writing, but not in another. The purchasing agent in one state, accustomed to a stated amount, should not forget that the laws of other states require sales of much smaller amounts to be evidenced by some forms of memorandum. When he is in doubt, some legal advisor should be consulted.

Copy by H. H. Shively, Babson Institute; drawing by G. E. Tullock.

TWO QUESTIONS OF VITAL AND TIMELY INTEREST, AND THE ANSWERS AS GIVEN BY TWO HUNDRED PURCHASING OFFICERS

How's Business



How Well is Business Prepared?

THE sharp upswing in business indices during September, the almost perpendicular rise in some commodity prices, the rush to cover requirements, reports of difficulty in getting deliveries—apparent shortage of materials and finished inventories, shortage of skilled labor in some fields, and possible shortages of manufacturing facilities to handle the sudden peak load—all of these factors have raised the question, "What is the actual state of business in American industry today?" The answer is of vital importance in drafting a sound purchasing policy.

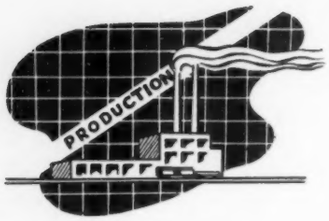
Some facts we know. For example, we know that business was broadening on a healthy basis quite independently of the European crisis. Then in the late summer the threat of war, the actuality of war, and feverish anticipation of the results of war, accentuated that advance, gave it an abrupt and abnormal acceleration, introducing both speculative and emergency factors into the situation. For the time being, those factors have overshadowed and obscured the cold statistical background.

We know, from trade reports and from the monthly business survey of the National Association of Purchasing Agents (which still counsels a conservative buying policy), that even prior to September 1st buyers were building up their inventories in orderly fashion and were lengthening their commitments.

We know that this crisis was no overnight development, but had long been brewing. Extensive preparations had been made, not only from the governmental or national standpoint both here and abroad, by belligerents and neutrals, but also on the part of industry, which had foreseen the economic repercussions that loomed ahead.

Much of the past month's activity has been based on opinions of the future, rather than on immediate requirements. It was prompted in anticipation of the possible or probable developments resulting from the European situation. Nevertheless, it can not be discounted on that basis. For an order, though prompted by judgment that may or may not be confirmed by later developments, and destined—at least for the time being—to go into the buyer's inventory, represents real business and a real manufacturing schedule for the vendor. It means *bona fide* orders for materials, placed by that vendor in turn, with his suppliers. In this way, the judgment or opinion becomes an actuality in the immediate view of business.

PURCHASING has made an up-to-the-minute factual survey of this situation. In the closing week of September, one thousand purchasing agents in diversified industries throughout the country were invited to contribute to this important study. The following data is derived from the more than two hundred replies received before press time, giving a good cross section. The industries represented cover a wide range, including manufacturers of cosmetics, silk hosiery and pipe organ parts as well as metal working plants and chemical industries which have been more intimately related to present wartime considerations.



PRODUCTION ACTIVITY IS UP

THE questions in this study covered three principal aspects of the subject. The first of these concerns manufacturing schedules, taking three points as a basis of comparison and trends: (1) the end of August, or prior to the actual outbreak of hostilities; (2) the end of September, this being the current situation, after the initial buying boom was well under way; and (3) scheduled production for the fourth quarter of the year, as representative of the period immediately ahead.

The answers show that production operations increased during September in 45.7% of the companies, held at previous levels in 44.3%, and contracted in 10%.

Looking ahead to the fourth quarter, 39.4% are scheduling operations at a higher rate than in September; 50.7% plan to continue operations at the current September levels; 5.6% expect to taper off in the closing months of the year; and 4.2% have no definite estimate of their own fourth quarter activity.

Viewing the total span from August to the end of the year, 25.4% show a continuing rise, i.e., an advance from August to September and a further rise from September into the fourth quarter. On the overall net comparison, disregarding the intermediate figure, 55.2% plan for greater activity; 34.3% expect to maintain the end-of-August level; and 10.4% will operate at lower rates. Six of the replies added the notation that the situation in their case is the normal seasonal trend, not materially altered by special factors of the present situation.

The average rates of activity of all reporting companies are:

August 31	75.2%
September 30	81.1%
Fourth quarter	87.1%

Analyzing these totals according to the three groups noted in the preceding paragraph brings out a rather significant difference in the spread of operating rates as between those which are expanding and those in which the rate is going down.

In the 55.2% of companies where operating rates are being stepped up, the rates are:

August 31	67.1%
September 30	79.4%
Fourth quarter	88.4%

This advance of 21.3 points actually represents an increase of 31.7%, and it applies to substantially more than half of the companies reporting.

In the 34.3% of companies which will maintain the August 31 level of operations over the balance of the year, the average rate was 87.5%, very close to the rate attained by those whose activity is currently expanding. While a considerable range of operating rates is represented in arriving at that average, it is also worth noting that 60.1% of these companies are consistently operating at full capacity and have been doing so since the late summer.

In the 10.4% of companies which will operate at lower rates during the fourth quarter, the three successive averages are:

August 31	82.4%
September 30	72.9%
Fourth quarter	72.4%

The decline, which is only a fractional one from September levels, brings operations to a point 12.1% below late summer activity, at which time this particular group was substantially (9.6%) ahead of the general average. The extent of the decline is less than one-half the extent of the advance shown in the larger group.

SUPPLIES ARE GENERALLY AMPLE

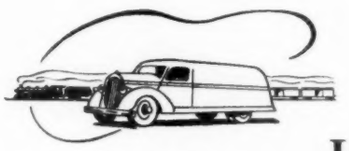
THE second aspect of the subject concerns the availability of materials. It indicates that there is no immediate shortage of supplies, as it reflects the recent extension of inventories and coverage, and does much to explain the relatively conservative attitude of purchasing agents in the current market.

On the basis of current advanced operating rates and the anticipated increase of the fourth quarter, these companies are covered on major materials for a period of 18.9 weeks in advance, on the average, carrying well into February, 1940. Even if this period should be shortened by a further advance in operations beyond what is currently expected, there is ample time to adjust the situation, and no emergency looms.

Breaking down the general average into groups according to the period covered in individual companies, the analysis reveals the following:

Covered for	1 month or less		7.3%
"	"	1 to 2 months	7.3%
"	"	2 to 3 "	25.0%
"	"	3 to 4 "	10.1%
Covered for	4 to 6 months		30.9%
"	"	6 to 9 "	4.4%
"	"	9 to 12 "	4.4%
"	"	more than a year	1.5%

Thus more than 60% of the companies have major materials in sight or on hand to the end of the year or beyond.



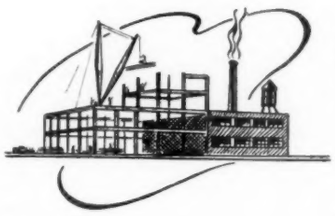
SOME DELAY IN DELIVERIES

INASMUCH as the effectiveness of some of this coverage will depend on the ability of vendors to make deliveries on contracts and orders, a report was asked on experience concerning any recent failures to deliver or to promise delivery on orders. 62.5% of the companies have thus far experienced no difficulty on this score. 37.5% report some slowness in delivery of certain materials, and a few cases of serious shortage, indicating a selective market situation such as has been graphically illustrated in the classification of materials by the Army and Navy Munitions Board as (a) strategic, (b) critical, and (c) essential — a classification which took into conideration difficulties of procurement as well as the nature of the materials themselves. Industry has a similarly selective problem.

Appearing most often in the list of materials on which deliveries have been delayed is steel, with specific examples including flat wire, terne plate, bars, shapes and sheets. Next in frequency are lumber items, but in one case the difficulty was directly attributed to a strike situation which has since been overcome. The third group is vegetable oils, including imported olive oil.

Other items on which some difficulty has been experienced are copper and brass products, scrap metal, tin oxide, chemicals, glycerine, imported fine petroleum products, textiles, scales, ledger paper, and corrugated boxes.

Serious shortages have been found in cadmium (which, incidentally, is included among the "critical materials" in the government list), and in lycopodium, for which, in one instance, a substitute material is now being employed.



MANUFACTURING FACILITIES INCREASED BY MODERNIZATION AND NEW CAPACITY

THE third aspect of the subject to be considered was production capacity, the questions covering present policy on plant modernization, plans for installing additional new capacity, and contemplated expenditures for modernization and purchase of various types of new equipment.

In 64.8% of the companies, the present modernization schedule is confined to a normal program of maintenance, with replacements of equipment contemplated only as required, and no definite plans for increasing plant capacity. Within this group, however, 29.2% (or 18.9% of the complete list) reported recent completion of extensive modernization programs, including several new plants erected within the past four years, and two completed and occupied in 1939. These, in other words, had anticipated the situation, whether by chance or by design, and would consequently have less of a modernization problem at the present time.

The remaining companies in this group of 64.8% —those which have not recently modernized and have no immediate program of the sort—have also been analyzed in relation to their respective operating rates. This shows that, as a group, they were operating at 70.5% on August 31st and expect to operate at 80.3% during the fourth quarter, both figures being considerably below the overall averages for these periods, indicating that on the basis of present equipment they can accommodate a greater than usual increase of business before approaching full capacity operation. This group includes all but one of the companies whose operations have declined during the period. 46.7% of the companies are among those whose business activity

is either holding level or falling off. Naturally there is less urgency or incentive for added capacity under these circumstances.

In 24.3% of the total number of companies, definite plans for additional new capacity are now under way, ranging from a moderate increase of 5% or 10% in several cases to the doubling of present capacity by a manufacturer of non-ferrous castings who has been operating at full capacity since summer. An additional 3.1% of the companies have tentative plans for some increase.

Including this number, 35.2% of the companies have inaugurated modernization programs of greater or less magnitude, ranging from a major construction and re-equipment project amounting to $575,000 down to replacement and improvement programs involving the expenditure of only a few thousand dollars.

MODERNIZATION PROGRAMS

PROPOSED expenditures have been classified under ten major headings, indicating the type and extent of the contemplated modernization. In a broad general program such as several companies are now engaged in, the work falls under several of these headings, and the total expenditure has been broken down and allocated accordingly, with no duplication in the totals.

Most prevalent as regards the number of companies (15.1%) and also representing the largest total expenditure, is the purchase of new machine tools, the average new investment for such equipment amounting to $26,558.00.

The second largest number of new projects (13.4%) concerned materials handling equipment, with an average expenditure of $5,604.00, and ranking sixth in respect to total expenditure.

Third in number of projects (13.0%) are new buildings, the average expenditure being $27,773.00, and amounting to the second largest single item in the total program.

Fourth in number of projects (11.5%), and seventh in the total amount of money involved, is electrical apparatus and equipment, the average expenditure being $7,680.00.

Fifth in number of projeects (11.1%), and eighth in total value, is the purchase of small tools. The averaging expenditure is $2,944.00.

Sixth in the number of projects (10.3%), and fourth in total value, are abrasives and grinders. The average expenditure for this type of equipment is $13,444.00.

Seventh in the number of projects (8.4%) is the miscellaneous classification. This includes two complete foundries, several large installations of specially built production equipment, a variety of storage facilities, and other modernization. The average expenditure is $31,829.00, accounting for the third largest group total.

Eighth in number of projects (6.7%), and ninth in total value, is the modernization of power transmission. The average expenditure is $2,250.00.

Ninth in number of projects (5.7%), and fifth in total value, is the modernization of power plants. This group includes the installation of some Diesel plants replacing other forms of power previously used. The average expenditure is $28,625.00.

Tenth in the number of projects (4.7%), and also in total value, is safety equipment. The average expenditure is $1,350.00.

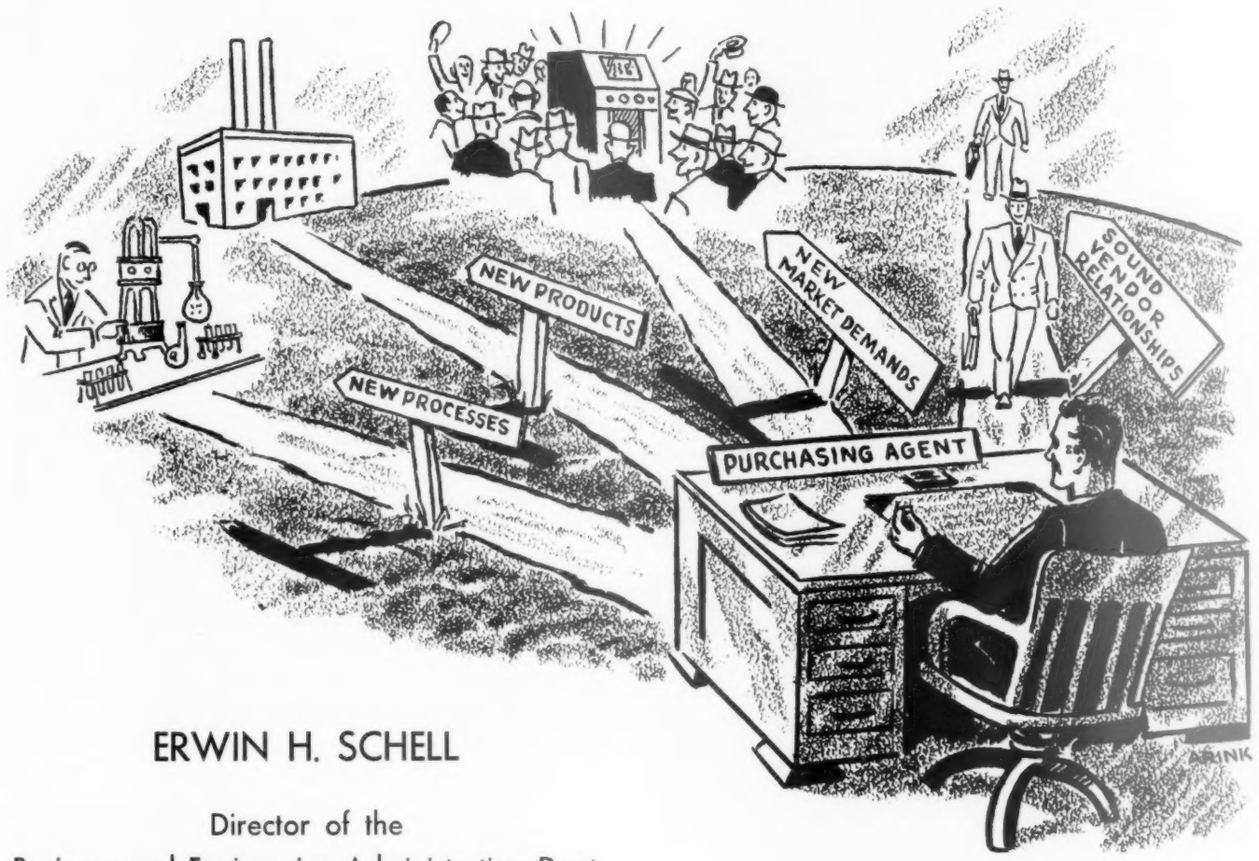
CONCLUSIONS

THE purpose of this study is not to establish any general trends or to amass impressive figures regarding purchases now being made or to be made in the near future. Rather it is to gather some concrete factual evidence regarding the adequacy of supplies and manufacturing capacity in relation to present requirements and operating rates, and thus to give substance and authority to a picture which has necessarily been largely a matter of generalization and conjecture. It is significant only in respect to domestic materials and facilities. It does not relieve the purchasing man of the necessity of a highly selective analysis when considering his own particular requirements.

It does indicate rather conclusively that, barring a sudden and very substantial war demand in excess of what has already been experienced, or the diversion of manufacturing facilities for the national defense, or runaway markets from any other source, American industry is equal to the demands that are likely to be placed upon it in the near future. It indicates that business is very definitely in an expanding cycle, and that manufacturers generally are making provision for that advance in their inventories and equipment, with a considerable forward-looking investment now going into capital goods.

With more than half of the manufacturers actively engaged in expanding and modernizing their plants, or having just completed such a program, it means that our production facilities will be not only more ample, but more efficient in the period that lies ahead. And in that fact there is a strong inference to other manufacturers that their own relative position in the competitive race may depend on their keeping pace with that development.

PURCHASING—
the life line of industry



ERWIN H. SCHELL

Director of the
Business and Engineering Administration Dept.
Massachusetts Institute of Technology

IN AN increasing number of our American industries, an extraordinary opportunity has been laid before the purchasing agent. Almost overnight, he has become confronted by issues of crucial importance. Modern research has placed him in the front line of action, in a new arena of competition where the play is fast and for high stakes, where a single business season may easily encompass the destruction of a hitherto prosperous enterprise and the birth of a full-grown competitor.

For years we have been talking about the increasing rate of technical change. As household consumers of radios, automobiles, refrigerators and similar products, we have come to expect each annual model to bring us improvement in the form of better quality at lower cost. As executives in manufacturing plants, we have seen the growth of serialized processing with its thinner and more swiftly flowing streams of output. We have seen our plants redivided in terms of products rather than processes. As purchasing agents, we have passed on to the vendors these demands for progress in price, quality and service factors. Yet it is only recently that we suddenly have found ourselves purchasing for the sheer security of our business—literally buying for dear life.

The reason is simple. Technical change originally presented itself to manufacturers in the form of improved machinery and processing. Its influence then stimulated the increase of design and engineering activities. Upon the advent of the plant research department, we assumed that the fountainheads of applied science were pretty well uncovered. And now from a gigantic cornucopia fostered by chemical research, we are showered with a host

of new synthetic materials. A discerning observer once classified our industries into those which are exploitive of natural resources, those which are adaptive of natural materials, and those which are creative of entirely new substances. It is in the last group that the rapid upthrust of human ingenuity is now occurring.

Progress—an External Factor

This outpouring of synthetic materials usually has its source outside of our long-established plants. Such products frequently flow from the processing departments of new enterprises whose activities and procedures are little known to us. Hence it will be to its purchasing agent that any given organization will logically turn for information and assistance in dealing with this rapid outreach of the creative industries into industrial markets previously considered the domain of adaptive manufacturing.

And the race is to be swift. The past few years have seen more than one instance where a competitor has suddenly come forth with a product transformed in appearance and often in nature through the use of synthetic materials. With the wide public acceptance of these newer substances, obsolescence of older forms takes place almost within a buying interval. The competitive advantage of these products of chemical science is obvious to anyone who will take a moment to examine their abnormally rapid emergence into common use.

Such change brings difficulty and with it its inseparable companion—opportunity. The executive of whatever rank or position who informs himself of these creative developments will be put into the breach by very necessity. And no member of the management is more logically fitted for such responsibility than is the purchasing agent.

These conditions will bring new relationships. They may radically alter our ideas concerning vertical integration in industry. They will surely affect relationships between vendor and purchaser. It is a principle that a creative industry may progress only in a limited way under the impetus of its own inventiveness. Soon it must turn to its market for assistance in determining precisely what it should create. Research in industrial materials demands the close collaboration of prospective buyer and seller at a far earlier period in the bargaining cycle than heretofore.

Anticipating Methods and Materials

This meeting of minds between parties in trade has for some time been displaying a tendency to occur at an increasingly advanced period before the signing of contracts. For many years, one of our foremost New England colleges has retained a college architect who, upon the advent of a new building project, has conferred, during the earliest sketch stages, with builders concerning possible construction economies growing out of current advances in the art. Agreement upon materials and methods has far preceded the placing of contracts.

A current counterpart is the presence upon the payroll of a progressive New England specialty manufacturer of an analyst who gives his entire attention to the examination of new products emanating from one of our large chemical companies. His responsibility is to determine the extent to which these latest contributions to higher standards of living may be incorporated in company products. Obviously, his relations with the vendor are necessarily of the closest, yet he is in no wise involved in contractual activities.

But my concern lies deeper. The purchasing agent of tomorrow will shoulder increased responsibilities in relation to vendors no less than to his own organization. And here such past relationships are distinctly to his credit. There are many examples of small organizations which owe their early development to the friendly assistance of an important buyer who has made auspicious beginning and gradual growth a possibility for them. There are innumerable instances in which the vendor, in time of trouble, has found his greatest resource to be the vital support of his market, when such support meant loss rather than profit for his customer. Many are the concerns which would never have weathered the storms of business depression were it not for the lifelines thrown them by more strongly entrenched industrial buyers.

Parties at Interest

Some years ago in examining the place of the purchasing agent in the manufacturing organization, I was impressed with the uniformly high position given this function. In any such array of several hundred executives bearing identical titles, there would naturally be varying degrees of ability. Yet this difference was not reflected in rank. Practically all reported to a high coordinating executive such as the president or general manager. Soon it became clear that this condition was due to the purchasing agent's possession of exclusive information concerning a significant group of persons whose welfare was vital to the business, namely the vendors.

These parties at interest, no less than the consumer, the job-holder, the stockholder or the general public, must be viewed with a strong sense of trusteeship. The general executive must have at hand dependable advice relating to each of these groups if his policies are to embrace the welfare of all parties concerned. Hence the purchasing agent necessarily reports to him. Indeed, it was this same feeling of trusteeship which causes one large organization to speak of its many suppliers as its

"resources" and to lay down stringent policies to the end that the well-being of this group, in good times and poor, be a matter of constant corporate attention.

Job or Opportunity

We all remember the tale of the strong man on the vaudeville stage; the squeezed lemon and the offer of reward to anyone whose strength could extract another drop; the acceptance of the challenge by the thin gentleman in the audience; the ensuing rain of juice; and the confession that he was the purchasing agent in a well-known automobile company.

I shall tell another story of a different turn. A number of years ago, a small company producing a quality product composed of natural resins had as an important customer a large automobile manufacturer. A letter from the purchasing agent brought the salesman to his office where he was, in substance, advised as follows:

"We have done business together for a long time. We have confidence in your organization and in your quality standards. A new synthetic substitute has appeared on the market. It offers important elements of superiority. We want to continue to do business with you and we will give you our order for the coming year. During that time, we hope you will place yourself in position to make an equally superior synthetic product so that it will not be necessary for us to break off our relations with you."

The salesman reported to headquarters. An executive was dispatched to obtain the services of a firm of consulting chemists. A professional research staff was placed in residence at the plant. Within a year a synthetic product was on the market and today this small business is secure beneath the protection of a competent research department and a new line of products which has almost entirely superseded those previously adapted from the natural resins.

New Responsibilities

Thus science is leading the purchasing agent to new thresholds of cooperation, of responsibility, of trusteeship. It has been a fascinating change. First, the purchaser's early stress upon price alone with its inevitable haggling and bickering. Then the advent of specifications and the spread of interest in quality. Later, with growing competitive parities in price and quality, service offered a basis for choice. Tomorrow's orders will increasingly go to the vendor who is in position to collaborate creatively with his prospective buyer. When the purchasing agent and the vendor show readiness to get their heads together before the act of purchase in order that mutual obsolescence may be avoided, there will come new security for both.

The effect of these changes upon purchasing policy and procedure will undoubtedly be marked. To grasp most effectively its possibilities, a new material must be seen in its native habitat and close to its place of birth. Purchasing agents who stand for company security will keep the overnight case packed for immediate use. Within ethical bounds, competitive developments must be watched with increasing vigilance. The purchasing agent's intimate awareness of trade developments will bring new and exacting duties. In the past, reconnaissance was the responsibility of the sales department. Now the buyer also must scan the competitive terrain.

Moving Forward Together

But greater than all this, the purchasing agent must remain loyal to the interests of present vendors who are tried and true and yet who are faced with the hazard of being behind the times.

Shortly after the outbreak of the Great War, the purchasing agent of a newly constructed shipyard found it necessary to place vast orders for fabricated steel even before drawings were available. I recall one rolling mill which completely transformed its manufacturing schedule as a result of his telephone call. They knew him of old. When he said the order would soon be forthcoming, they knew they would receive it without fail. Such relationships do not grow up over night. They are worth conserving.

Buyers and sellers of long standing should and must cooperate in meeting this sweeping trend of change. They should join forces in a combined attempt to translate these apparent difficulties into future opportunities, and advance together in their quest for mutual security.

Many Uses for Fiberglas

Fiberglas, which found its first commercial application in the dust stop air filter, is now a factor of importance in forty-nine different industries, says James Slayter, Vice President of the Owens-Corning Fiberglas Co. Its resistance to mildew, rot, and acids, make it particularly valuable as an industrial textile. It is used as motor insulaton in motors ranging from fractional horsepower to the largest type generators such as will be installed at the Grand Coulee Dam, and has retained its effectiveness for more than eighteen months in difficult mine conditions where three months was formerly considered the normal life of ordinary insulation.

An airplane cloth of Fiberglas, weighing two ounces per square yard, tested to a tensile strength of 115 pounds per square inch, compared with the best specification cotton airplane cloth weighing four ounces per square yard and breaking at 80 pounds per inch of width. This extreme strength, coupled with light weight, durability, and excellent wearing qualities under repeated laundering, etc., adapt the material to a wide range of usage.

"Pardon me, gentlemen. Am I intruding?"

Using Low Carbon Steels

A material of varied properties and a wide range of applications when those basic qualities are understood and controlled

CHARLES H. HUGHES

***THE AUTHOR** served as technical aid to the U. S. Shipping Board, and was in charge of the preparation of specifications for iron and steel castings and forgings, brass and bronze castings, and other metal products. The discussion of steels which commences in this issue is based upon his exhaustive researches in connection with that project*

Photographs by courtesy of Carnegie-Illinois Steel Corp. and Jones & Laughlin Steel Corp.

STEELS are known by the process by which they are made, as Bessemer, open hearth, or electric furnace, and by the element that affects their properties the most. Thus, an open hearth medium carbon steel is one made by the open hearth process, and contains a medium percentage of carbon, as in the range of .25 to .40%. Whether a plain carbon steel or an alloy steel is selected depends on the purpose for which it is intended and the cost, for there is no one analysis that is good for all uses, each having a field for which it is best adapted.

An illustration of several different steels employed in the same structure is found in the Bayonne Bridge, connecting Staten Island, N. Y., with Bayonne, N. J. This is one of the largest arch bridges in the world, with a hanging roadway, the length of each span, from center to center of bearings, being 1,675 feet. The upper cord of the arch is of carbon silicon steel, the lower of carbon manganese, while the vertical members and the roadway are of medium carbon.

By adjusting the proportion of carbon for specific purposes, carbon steels may be rolled into angles, channels, plates, strip, etc., or cast and

Parts made of screw stock

forged into machine parts, or made into tools. Those discussed in this paper are for structural purposes and machine parts; tool steels require a separate treatment.

Carbon steels range in composition from

Carbon	0.10 to 1.40%
Silicon	0.10 to 0.50%
Phosphorus	0.02 to 0.13%
Manganese	0.30 to 0.90%
Sulphur	0.02 to 0.30%

The percentage of carbon largely controls the physical properties. Even an increase or decrease of only one point (0.01%) will affect the strength, elastic limit, hardness, and ductility. Thus carbon will *increase* tensile strength, hardness, resistance to wear and abrasion, and difficulty in machining; it will *decrease* ductility, toughness, and resistance to shock and impact.

In structural carbon steels, carbon increases the ultimate strength about 1,000 pounds per point (0.01%), and increases the elastic limit or yield point about 600 pounds per point. Carbon increases the tensile and compressive strengths up to the forming of eutectoid steel (carbon 0.81 to 0.90%). The elastic limit is about 60% of the tensile strength, but if the steel has been annealed it is reduced to about 50%; hardened steels may have an elastic limit of 70%. A steel with 0.70% carbon, if heated to a red heat and quenched in water, becomes very hard; with carbon above 1.0% the tensile strength decreases as the carbon is increased.

Silicon tends to remove gases and oxides from steel, preventing blowholes from forming. Up to 0.30% it has little effect on the tensile and elongation, but above this, to a certain range, it increases the tensile. Percentages below 1.0% each of manganese and silicon are desirable, manganese preventing the forming of iron sulphide, and silicon, up to above 0.40%, increasing the strength without affecting the ductility. The affinity of manganese for sulphur is stronger than that of iron for sulphur, with the result that the manganese controls the sulphur and prevents the formation of iron sulphide, an undesirable constituent. Manganese also acts as a degasifier of molten steel, and within certain limits increases the tensile strength and toughness.

Sulphur in small quantities up to 0.10% has little effect on low carbon steel, but above this, to about 0.15%, improves the machining qualities. Too large a percentage tends to make steel "hot short" or "red short", that is, a tendency to crack when being hot rolled, hammered, or worked. Cracking is more common in screw stock, a high sulphur steel, than in a low.

Phosphorus is an undesirable element, forming iron phosphide, which makes steel "cold short" or brittle at ordinary temperatures when subjected to sudden shocks or blows. The effect of phosphorus on low carbon steels is less than in high, hence in the latter it is often specified to be under 0.01%. High phosphorus steels have a very low impact value at sub-zero temperatures. To improve atmospheric and moisture resistance of low and medium carbon steels, copper may be added.

Although two carbon steels from the same heat may have the same chemical analysis, yet they may differ in cold working, punching, shearing and in forming, or in their properties after heating. These differences have been given various names, as timbre, personality, body, etc., and may not be revealed by mechanical tests nor by chemical analysis. To prevent variation in steels from the same heat and of the same composition, the entire process of making, and the temperatures maintained, must be at all times under close regulation.

So that machine steels will run uniformly, their microstructure and hardness should be closely controlled. The grain size, which can be controlled by annealing, hot and cold rolling, doubtless has an effect on the timbre or personality. The smaller the crystals or grains, the more ductile is the steel. Fine grain carbon steels are easy to forge, and are tough and ductile, while coarse grain steels are easier to machine, and harden deeper when heat treated.

The weight of rolled carbon steel as adopted by the A.S.T.M. and A.A.S.M., and approved by the Bureau of Standards, is 0.2833 pounds per cu. in., or 489.6 pounds per cu. ft. Cast and forged steel is often taken at 490 pounds per cu. ft. The coefficient of expansion is .000007 in. per degree Fahrenheit; the melting point (carbon 1.0% and under) 2640° - 2795° F.

In this discussion, carbon steels are grouped as low carbon (0.10 to 0.25%), medium (0.26 to 0.60%), and high (0.61 to 1.40%). General properties and applications are listed in Table 2. Physical properties vary with the carbon. Compressive strength is about the same as the tensile, but in steel columns the ratio of length to diameter or size of section must also be considered, as failure may be caused by buckling, before crushing.

Carbon steels, depending on the composition and form of the piece, may be given either mechanical or heat treatments to develop specific properties. In general, hot mechanical treatment, such as working a forging under a steam hammer or press, breaks up the crystalline structure of the steel. Cold working, as in drawing and rolling, increases the tensile strength but decreases the ductility. Heat treatments include those giving strength and hardness, as by quenching and tempering, and others increasing ductility and softness, as by annealing.

Low carbon steel is usually chosen for purposes where ease in working is desirable, and where great strength is not necessary. It includes low carbon carburizing steels, also those often made by the Bessemer process and rolled into rounds, squares and other sections, which are sometimes known as "soft steel," that can be readily forged and machined.

A low carbon carburizing steel that is widely used is SAE 1020, with a composition of

Carbon	0.15 to 0.25%
Manganese	0.30 to 0.60%
Sulphur	0.55%
Silicon	0.15 to 0.30%
Phosphorus	0.45%

This is soft, ductile, and "sticky" to machine, the machining properties being improved by normalizing before machining and then carburizing after shaping. Bolts and cold headed parts may be made of this steel, which can also be forged, welded, bent cold or hot, carburized or heat treated. Untreated rods have tested:

Tensile strength psi	52,000 to 62,000
Elastic limit psi	30,000 to 35,000
Elongation	25%
Reduction of area	45%

By slightly increasing the manganese and adding a small percentage of molybdenum, the machinability, strength and ductility are increased over plain carbon steel. Such a steel showed on testing:

TABLE 1

Effects of Elements in Carbon Steels

(Structural, Castings and Forgings)

Carbon	Increases strength and hardness, but decreases ductility and toughness.
Manganese	Deoxidizes and desulphurizes; increases tensile strength
Silicon	Deoxidizes; slight increases in ranges from 0.20% to 0.50% increase tensile strength with little effect on ductility.
Sulphur	Causes brittleness when hot; low carbon steels with a high percentage of sulphur are free machining.
Phosphorus	Undesirable; causes brittleness when cold.

TABLE 2

Carbon Steels

	General Properties	Applications
Low carbon (0.10-0.25%)	Machines easily, readily forged and welded. Tensile strength 50,000 to 60,000 psi. Cannot be heat treated, but can be carburized if carbon is in range of 0.10-0.15%.	Small and medium size castings and forgings. Structural shapes and plates. Rivets. Pipe and tubes. Sheet steel under No. 10, U. S. Gauge. Screw stock. Carburized cams, gears, etc.
Medium carbon (0.26-0.60%)	Stronger than low carbon steel, but does not machine as easily. With carbon above 0.30% may be heat treated. If carbon is above 0.35%, difficulty is encountered in welding. Tensile strength 60,000 to 100,000 psi.	Large castings and forgings. Reinforcing rods for concrete. Shafting, connecting rods. Boiler drums and pressure vessels for oil refining and chemical processes.
High carbon	High strength obtainable by heat treating or cold drawing, but ductility is lowered. Tensile strength 100,000 to 160,000 psi.	Wire for rope and springs. Rails. Car wheels. Tools.

Tensile strength psi	68,000 to 70,000
Yield point psi	48,000 to 50,000
Elongation	29% to 32%
Reduction of area	54% to 56%

By carburizing, a hard case with a tough core may be secured without cracking or distorting, suitable for plug and thread gauges, piston pins, boring bars, cams and cam shafts, ball races, and wrist pins.

Soft steel, a general term given to many machining steels, has a typical analysis of

Carbon	0.10 to 0.14%
Manganese	0.60 to 0.90%
Sulphur	0.08 to 0.15%
Silicon	0.15 to 0.30%
Phosphorus	0.09 to 0.13%

It has a tensile strength of 45,000 to 55,000 psi. It is easy to machine because of high sulphur, hence has been used for quantity production of machine and cap screws, small gears and machine parts, and shafts for small motors. It can be welded, can not be heat treated, and is primarily useful for machine parts where great strength is not required. With slight modifications in the above composition (decreasing the carbon and increasing the sulphur) screw stock and high sulphur steels are secured, which are superior to soft steel in automatic scrw machines.

Screw stock is a trade term applied to low carbon high sulphur steel, including SAE 1112 (Bessemer screw stock) and 1120 (open hearth screw stock) which are free cutting, as is necessary in automatic machines for rapidly turning out screws, studs, bolts and machine parts. SAE 1112 has physical properties about the same as SAE 1020 mentioned above, but is not suitable for heat treating on account of the high sulphur; neither is it recommended for bending, upsetting, nor for pieces subject to severe shocks. SAE 1120 has good cutting speeds, although not as good as 1112, but 1120 has greater strength, is more dependable, and can be bent and upset.

Cold drawing of rounds, squares, and other shapes of low and medium carbon steels increases the tensile strength, and also accurately finishes to a given size without machining. Depending on the cross section of the piece desired, it may be more economical to cut it from a cold drawn bar, than to machine a hot rolled bar.

A few of the many applications of cold drawn steels are overhead shafting, machine shafts, highly stressed parts, and articles that would be difficult to make by machining.

TABLE 3

Tests of Cold Drawn Rods

(¾-inch diameter)

	SAE 1020	SAE 1120
Ultimate tensile strength psi	72,400	74,900
Yield point psi	66,000	70,600
Elongation	23%	21%
Reduction of area	53%	42%
Brinell	148	157

TABLE 4

Bolts, Screws and Nuts and the Steels from which they are made

(Tentative Recommended Practice, A.S.S.T.)

Classification	SAE Steels except where indicated
Cap screws	1010, 1020, 1035, 1112, 1120, 2330, 3135
Carriage bolts	1010, 1020, A (see note 1)
Connecting rod bolts	2330, 3135
Lag screws	1010, 1020, A (see note 1)
Machine bolts	1010, 1020, 1035, 2330, 3135, A (see note 1)
Machine screws	1010
Plow bolts	1010, 1020, A (see note 1)
Rivets	1010
Set screws	1010, 1112, 3135, 2330 (Set screws made from plain carbon steels are usually case hardened)
Step bolts	1010
Stove bolts	1010
Track bolts	1025
Nuts	1112, B (see note 2), C (see note 3)

Note 1. Open hearth steel, hot rolled, Carbon 0.14-0.22; Manganese 0.60-0.90; Phosphorus 0.045 max.; Sulphur 0.075-0.12; Silicon 0.075-0.15

Note 2. Cold punched nut. Carbon 0.09-0.15; Managanese 0.50-0.80; Phosphorus 0.04 max.; Sulphur 0.10-0.13

Note 3. Hot punched nut. Carbon 0.10-0.20; Manganese 0.50-0.80; Phosphorus 0.09 max.; Sulphur 0.075-0.15

Special Materials: for special purposes bolts are made from stainless, non-corrosive, and non-ferrous metals.

TABLE 5

Tests of Low Carbon Steel Castings

Carbon	Manganese	Silicon	Sulphur	Phosphorus	Tensile strength psi	Yield point psi	Elongation %	Reduction of area %	Treatment of steel
0.14	0.45	0.29	0.037	0.016	59,000	34,000	18	28	1650 F (995 C) 5 hours furnace cooled
0.20	0.72	0.27	0.03	0.04	70,000	47,000	26	50	1690 F (920 C) 10 hours furnace cooled
0.21	0.94	0.19	0.03	0.07	78,000	53,000 elastic limit	27	42	1560 F (850 C) 3 hours furnace cooled

Sheet steel under No. 10, U. S. Gauge, has a carbon below 0.12%, with phosphorus about 0.04% and silicon 0.04 to 0.07%, the phosphorus and silicon being adjusted so that the sheets will not stick together when piled. The sheets find wide application for articles that may be stamped and formed, which operations are usually performed between the elastic limit and the ultimate tensile strength, neither of which should be exceeded. Sheets should be galvanized or otherwise protected if exposed to weather and moisture.

Strip steel is also made of low carbon steel, and is used for stamping smaller articles than from sheets.

Plates and shapes for structural purposes, of the grade known as regular open hearth, have a carbon of about 0.10%, and a tensile strength of 35,000 to 50,000 psi. Plates of flange quality for forge welding have a carbon of around 0.20%, are ductile and are not injured by heating and cooling, nor by shearing and punching. Rivets with carbon 0.11% have a tensile strength of approximately 54,000.

Low and medium carbon steel is used for many tubular products, including lap welded and seamless tubes for boilers and superheaters, also welded and seamless tubes for boilers and superheaters, also welded and seamless pipe known as standard, extra strong and double extra strong. Typical compositions and properties of steel for tubes and pipe are:

Carbon	0.10 to 0.20%
Manganese	0.30 to 0.60%
Silicon	0.25% maximum
Phosphorus	0.04% maximum
Sulphur	0.45% maximum
Tensile strength psi	62,400
Yield point psi	42,000
Elongation	36%
Reduction of area	67%
Coefficient of expansion at 900° F, 9.5 x 10^6 inch per inch per degree F.	

Steel as above is good for service up to 900° F, where corrosion and oxidation are not important, but where these factors are important an alloy steel is necessary. Manufacturers' standard specifications No. 300-35 (Technical Committee of the Association of American Steel Manufacturers) for seamless cold drawn steel heat-exchanger and condenser tubes, and specification No. 100-35 seamless low carbon steel tubes for refinery service are similar to that outlined above. Steel tubing has a higher weight strength than any other steel shape, and has the advantage of being machined to size with a minimum scrap loss.

Low carbon steel for castings, because of its lower strength and indifferent response to heat treatments, is not used as much as the medium carbon grade. However, it may be annealed and carburized. When annealed, castings have stood up well if exposed to moderate temperatures, as ladles lined with brick for holding molten metal. Gears and parts subject to wear have been made of low carbon steel, carburized. Steels with carbon 0.08% and manganese 0.05% have a high magnetic permeability, and have been used for electric motor frames, magnetic chucks, and other electrical apparatus. Tests of low carbon steels are given in Table 5, but when higher properties are wanted, the medium grade, with carbon 0.22 to 0.35% is selected.

New Officers for E.N.Y. Association

New officers of the Purchasing Agents Association of Eastern New York, for 1939-40, are as follows: President George L. Brown of Kenwood Mills, Rensselaer; Vice President, Amos K. Munson of United Traction Co., Albany; Secretary, W. Oliver Glenn of A. P. W. Paper Co., Albany; Treasurer, S. C. Main of National Commercial Bank & Trust Co., Albany; National Director, J. Leland Hodgkins of H. B. Kimmey Co., Albany; Executive Committee, A. B. Wadsworth, Jr., of Allegheny Ludlum Steel Co., Watervliet, H. C. Clauson of Clauson Iron Co., Albany, and Frank M. Roos of Consolidated Car Heating Co., Albany.

Dodson Appointed

EMERY F. DODSON has been appointed purchasing agent for Yolo County, California, succeeding George H. Hoppin, who is retiring because of ill health after serving in that position ever since it was first created 18 years ago.

Fisher Named City P. A.

WAYNE FISHER has been appointed city purchasing agent at Elwood, Indiana.

Scott to Scullin Steel

GEORGE E. SCOTT, for the past 25 years purchasing agent of the Missouri-Kansas-Texas Lines, with headquarters at St. Louis, resigned from that position October 1st to become vice president and assistant sales manager of the Scullin Steel Co., St. Louis. Mr. Scott has been actively in railroad work since 1901, when he became a messenger on the old Lake Shore & Michigan Southern Railroad at Cleveland. He served as purchasing agent of both the M-K-T and the St. L.-S. F. under Federal control and was a member of the Regional Purchasing Committee of the Railroad Administration. He has likewise been active in the Purchases and Stores Division, Association of American Railroads, serving as a member of the general committee from 1927 to 1937 and as chairman of the organization from 1932 to 1935.

Downey Is Honored

BERT F. DOWNEY of the Yost Superior Co., Springfield, Ohio, charter member of the Springfield Purchasing Agents Association, received the Thirty-third Degree of Masonry, highest honor in the fraternity, at Boston, Mass., September 27th.

"I've got to get 30% off—better make it 30 and 10."

SILHOUETTE STUDIES

Otto Eugene McClatchey

HIS name is O. E. McClatchey. Few persons know what the initials stand for. Not that it matters. Everybody, including his wife, calls him "Mac." He is purchasing agent of the Barnsdall Oil Company, Tulsa, an organization engaged in the production, refining and marketing branches of the petroleum idustry. Mac has been conspicuously active in purchasing circles locally and nationally since he joined the Purchasing Agents Association of Tulsa in 1923. Like all purchasing men, his duties are of a confining nature, but having an unusual supply of energy, he finds time to engage in several diversions of an outdoor nature such as hunting, fishing, golf. He is also an enthusiastic follower of football, baseball, hockey and all sports and pastimes involving strenuous action. His most recently expressed desire is that he may learn to handle an airplane. Not exactly that he wants to qualify for a solo or a pilot's license, simply that he wants to know what to do with the controls if emergency or opportunity make it necessary for him to assume such responsibility when in the air. Those who know the workings of his mind would not be surprised any time to learn that he has been skimming the tree tops in the vicinity of Tulsa in an air jallopy of some kind. He is also strongly civic minded and frequently is called upon to aid in organized efforts for city improvement and community welfare.

State pride is an outstanding characteristic of the Southwest. Consequently, Mac loyally proclaims he is a Kansan, or (if you say it with a smile) a Jayhawker. Chanute, not far from the Oklahoma line, is where he first appeared on the scene. This town owes its development largely to oil and natural gas fields in that vicinity. He completed the grade school course in the old home town and attended high school for two years when the opportunity came to go out into the business world. During vacation periods, he worked on his parents' farm. He portrays a vivid picture of youthful activity doing these chores before farm machinery became a necessity in the enlarging areas of his home state.

His first job was in construction work with the Bell Telephone Company at Chanute. Soon realizing the need for additional educational equipment for a business career, he resigned this position and completed a two-year course at the Chanute Business College.

In 1914 he stepped over the boundary line into Oklahoma, where he has since remained except for a brief period. He went to Sapulpa, then an important business center for the surrounding oil fields, as wire chief for the Bell Telephone Company. In 1916 he was transferred to Bartlesville. Oil was coming along in a big way and had grown to be the state's largest industry. Desirous of getting into the industry, he went with the Empire Companies (now Cities Service Oil and Gas Company) in pipe line and construction work. Literally he started on the ground floor.

HIS labors in this particular capacity were not of long duration. When the call to war came in 1917, Mac laid down his tools, without waiting to have his number put up, and as a loyal Jayhawker went back to the old home town and voluntarily enlisted in the 117th Ammunition train in the famous Rainbow Division. After preliminary training, he landed at Brest France, in October, 1917.

An army man has no choice as to where he shall go, but Mac likes action and he got plenty of it. During 18 months of service, his company participated in five major offensives. Starting on the Alsace-Lorraine front, his outfit later engaged in the battles of Champagne, Belleau Woods, St. Mihiel and the Argonne.

A month before the armistice was signed, Mac had been detailed to special detached service with a machine gun battalion for mopping up purposes in the town of Romagne in the Argonne. His story almost ended there, but fate evidently reserved him for escapes almost as narrow later on in pastimes of peace. He got into the path of an enemy machine gun, several bullets from which entered and emerged from his anatomy. One of the missiles scraped the base of his head and missed by less than an inch putting lights out. He was sent to the base hospital at Dijon, where he remained for three months.

He was then granted a twenty-six day furlough which he spent with a buddy in gallivanting over friendly territory in such spots as Nice and Cannes, on the French Riviera; Monte Carlo; Amsterdam, Holland; Antwerp and Liege in Belgium. Few privates of the American Expeditionary Force saw more of Europe than did McClatchey and his pal. When these play days were over, he returned to his company, which was part of the army of occupation, near Cob-

lenz, where he remained until May, 1919, when the company sailed for home and was discharged.

His inclination was still toward the oil industry, and he resumed his employment with the Empire Companies at Bartlesville. Later in the year he was transferred to the then booming oil town of Burkburnett, Texas, to assist in completing some construction work. When this was finished, he went with the Phillips Petroleum Company of Bartlesville, in August 1920, as chief clerk in the purchasing department. His purchasing activities date from that time.

In 1921 a desirable opportunity came to take a position in the material and supplies department of the Barnsdall Oil Company. He has been with this organization continuously since then, working gradually up to the present position, to which he was appointed in 1930.

IN 1923, while still an assistant in the department, he joined the Purchasing Agents Association of Tulsa. He has been a worker and a leader in all the activities of the organization during the intervening period. For McClatchey to assume an obligation means that it will be fulfilled. His attendance record for the 16 years of membership is as perfect as humanly possible. On no occasion has he absented himself from a meeting or an association affair of any kind unless for imperative reasons. His associates have recognized his ability and fitness on many occasions by electing him to various offices, including that of president, and to serve on many important committees. In all these assignments his work has been outstanding.

He is nationally minded as regards a purchasing organization. He believes that the N.A.P.A. should be numerically and financially strong, and he has been a consistent and outspoken advocate of all measures designed to achieve these objectives. He has attended and participated in all national conventions since becoming purchasing agent of his company, and has acted as convention chairman for Tulsa Association on several occasions. His enthusiasm in this respect has always produced good results.

The Oil Company Buyers' Group of the N.A.P.A. is the main point of contact for a large majority of the members in the Mid-Continent area. It was in this direction Mac manifested his greatest interest in affairs of national scope. He was chosen chairman of the Group at the Cleveland convention in 1934. Each successive year since then his associates have indicated their confidence in him by unanimous re-election. When he assumed the duties of chairman, the Group had under consideration a major objective of simplification of sizes, weights and grades of oil well casing. The project was as wide in scope as the oil fields of the United States. Accomplishment would mean savings for individual companies and a huge total for the oil industry. Group members in all sections of the country cooperated in this undertaking. For the Chairman, it required thorough understanding of the many phases of the problem, a lot of hard work, and no small amount of diplomacy and tact in dealing with conflicting individual ideas and opinions regarding details and procedure.

It is worth noting that the group objective was basically achieved at the St. Louis convention in 1938, when a preferential list, as it was decided to call it, was agreed upon and accepted by the pipe manufacturers.

While it is not possible to police this movement, it is essential that as close adherence as possible be given to the adopted schedule. This the chairman is doing, with the practical knowledge in mind that operating conditions may involve some changes.

Recently Mac was appointed a member of the Mid-Continent sub-committee on the standardization of oil country tubular goods of the American Petroleum Institute. This will keep him in direct touch with both manufacturers and users of tubular goods on a large scale. The contact will be useful in handling affairs of the Oil Company Buyers' Group.

THE really big moment in Mac's life occurred in 1922. He met and married Ruth Thompson, a Tulsa girl. They are ideally happy in their lovely home. She is his inseparable companion and a good pal to his many friends. When Mac is at an N.A.P.A. convention, Ruth is sure to be there too.

Mac's first choice among outdoor sports is golf, which is a year-round pastime in Tulsa. He's a good player, also a vociferous one. In spite of the fact that by impulse he's of the club-smashing type when he foozles a shot, he consistently turns in a score under 80 on a 72 par course. In action, it is said, his conversation can be heard in all directions, talking to the ball, his partners, opponents, anyone or anything in sight or earshot. He talks a marvellous nineteenth hole, but not much beyond that. And he doesn't mix golf and business.

The coming of January annually is looked forward to keenly by all of Mac's sales friends. During the fall of each year he goes hunting for big game and always brings home the bacon. The kill is put into cold storage for Mac's annual dinner. Salesmen only are invited to this event. They come from various sections of the country, as well as locally, from a carefully selected list in which all suppliers get fair representation. It is a happy occasion, de-

Continued on page 78

How HIGH will metal PRICES go?

HAROLD A. KNIGHT

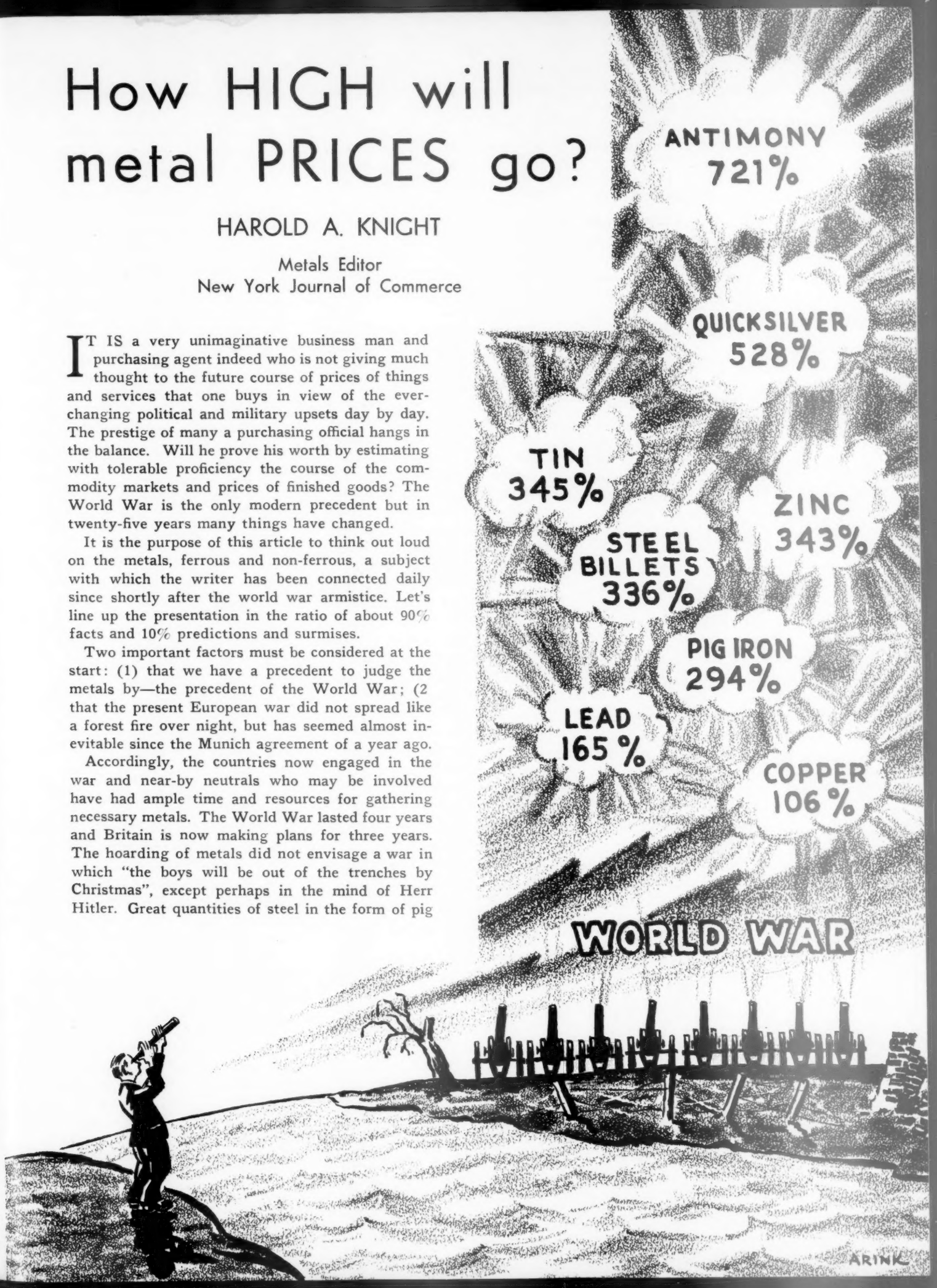
Metals Editor
New York Journal of Commerce

IT IS a very unimaginative business man and purchasing agent indeed who is not giving much thought to the future course of prices of things and services that one buys in view of the ever-changing political and military upsets day by day. The prestige of many a purchasing official hangs in the balance. Will he prove his worth by estimating with tolerable proficiency the course of the commodity markets and prices of finished goods? The World War is the only modern precedent but in twenty-five years many things have changed.

It is the purpose of this article to think out loud on the metals, ferrous and non-ferrous, a subject with which the writer has been connected daily since shortly after the world war armistice. Let's line up the presentation in the ratio of about 90% facts and 10% predictions and surmises.

Two important factors must be considered at the start: (1) that we have a precedent to judge the metals by—the precedent of the World War; (2 that the present European war did not spread like a forest fire over night, but has seemed almost inevitable since the Munich agreement of a year ago.

Accordingly, the countries now engaged in the war and near-by neutrals who may be involved have had ample time and resources for gathering necessary metals. The World War lasted four years and Britain is now making plans for three years. The hoarding of metals did not envisage a war in which "the boys will be out of the trenches by Christmas", except perhaps in the mind of Herr Hitler. Great quantities of steel in the form of pig



iron, scrap, ingots, billets, sheet bars, etc., which can be converted rapidly into finished forms had been collected at the steel mills and in warehouses.

Supplies and Facilities Abroad

Likewise the non-ferrous metals such as copper, lead, zinc, tin, platinum, and antimony were hoarded where nations were not sure of a constant supply in case of war. Great Britain, owning modern copper refineries in Rhodesia and having access to Canadian and Australian lead, has depended on being a beaver rather than a hoarding squirrel. Even in the peace-minded United States, and before the present war started or perhaps was seriously expected, the Navy Department during 1938 bought large tonnages of tin, an entirely imported metal, enough for perhaps ten years of peace or two years of war.

Great Britain is stronger by far in steel than in 1914, not only because of more steel capacity in England, but greatly augmented capacities in Canada, Australia and India. In the last country, for instance, perhaps the purest and best pig iron in the world is made, iron which is imported into the United States because of its quality, to mix with domestic iron.

The allies are in better position as regards steel because of availability from neutrals. Holland has built a modern blast furnace since the World War, which also supplies the United States. Lorraine has coal, iron and steel which in 1914 belonged to Germany. Belgium is as yet not invaded by Germany, as was the case in 1914, and this steel is for sale to the allies. All of French soil is in possession of France, though the northern section, containing steel mills, soon fell into the hands of the Germans during the World War.

Russia has forged ahead tremendously in industry since the World War, thanks to her own natural resources. She is probably self-sufficient, even in case of a major war, both in steel and non-ferrous metals, including platinum, one of the most expensive but necessary war materials.

All of this in mentioned to show how much more self-containing are the belligerent countries than in 1914 and the probability that they will buy less from the United States. The topic is worth developing further.

Japan has become remarkably self-sufficient as regards finishing mills, but still needs huge quantities of steel scrap and copper, the bulk of exports from the United States having been sent there. But there is but little market for American finished steel and copper in Nippon.

Among the neutral and now peaceful countries there has been some expansion in steel making and metals mining and refining, but not to the extent of the present belligerents. These neutrals for the present at least should be the United States' best markets.

The better methods of salvaging metals on the battlefields will also be a factor. News dispatches from Germany's invasion of Poland spoke of the well organized salvage division which picked up shell fragments before they had cooled, these to go back into the open-hearth or Bessemer furnaces. Some kinds of finished steel of good quality can be made entirely of scrap, without the use of a virgin product such as pig iron. But of course scrap is none too plentiful.

World War Prices

When the World War started on August 1, 1914, manufacturers and consumers had no precedent to go by. They rightfully thought that peace projects would fall off and could not visualize the war demand which followed. In August the American steel makers tried to raise prices in the correct belief that the war would need American steel. But consumers thought otherwise and business continued to dwindle, the low prices of the year having been reached in December, when many companies operated at only one-third of capacity.

In the spring of 1915 demand for steel increased unmistakably, and prices for export arose. In late summer the boom was on. Billets advanced rapidly, they being used as raw materials for many kinds of munitions. Plates, used for hulls of ships, soared. Wire products such as barbed wire for military operations became the highest priced in fifteen years by December. Pig iron lagged until a year after the war started but then rose rapidly, being $6 per ton higher by the year's end.

In 1916 former prices looked cheap, and the entrance of the United States into the war in 1917 was the signal for even more price advances. In July the Government took charge and set maximum prices for United States consumers and the allies. These fixed prices were 30 to 50% under previous peaks, but were plenty high enough for fancy profits.

In 1914 the price of tin plate was $3.35 per box of 100 pounds; in 1917 the price of $12 prevailed, while today the price is $5. Sheets in 1914 were 1.95 cents, rising to 8.50 cents per pound in 1917, and selling at 3.10 cents today. Billets were $21 per ton in 1914, rose to $100 per ton in 1917, and are now $34 per ton.

The experience among the nonferrous metals was parallel to iron and steel. Copper prices slumped during the first few months of the World War, but subsequently rose to the highest levels of the twentieth century. From July, 1914, prices declined from a high of 13¾ cents per pound to a low of 11⅛ cents in November of that year. However a sustained advance set in at that point which carried the price up to 37 cents in February, 1917. Since the war the top price has been 24 cents and the bottom 5 cents in 1922.

METAL PRICES DURING THE WORLD WAR—AND TODAY

		1914 (Monthly Average)						Yearly Average				1939	
		July	August	Sept.	Oct.	Nov.	Dec.	1915	1916	1917	1918	Aug. 31	Sept. 30
Aluminum, 99%	per lb., N. Y.	.1759	.2038	.1925	.1825	.1875	.1900	.3377	.6060	.5092	.3332	.21	.21
Antimony	per lb., N. Y.	.0544	.1305	.0979	.1164	.1414	.1315	.2954	.2536	.2126	.1258	.12	.14
Brass, high sheet	per lb., N. Y.	.1387	.1350	.1312	.1275	.1225	.1325	.2350	.3911	.3500	.2840	.1685	.1865
Copper, electrolytic	per lb., N. Y.	.1349	.1241	.1213	.1168	.1200	.1320	.1754	.2830	.3008	.2454	.105	.12
Iron, composite price	per ton	12.92	12.91	12.83	12.67	12.42	12.39	13.54	19.43	36.11	33.24	20.61	22.61
Lead	per lb., N. Y.	.039	.039	.038	.0363	.037	.038	.0476	.0685	.0864	.0743	.0510	.0555
Quicksilver	per flask, N. Y.	37.00	36.00	90.00	65.00	50.00	52.00	76.00	128.00	108.00	123.00	97.50	170.00
Silver	per fine oz., N. Y.	.5468	.5434	.5329	.5065	.4908	.4937	.4969	.6566	.8142	.9677	.355	.3913
Steel, composite price	per lb.	.014	.0145	.0147	.0145	.0139	.0136	.0153	.0267	.0419	.0354	.02236	.02236
Tin, Straits	per lb., N. Y.	.325	.5175	.355	.30	.3325	.3375	.387	.439	.616	.857	.495	.63

The Domestic Situation

Here in 1939 the course of steel and metal prices will be governed by several important factors. Uncle Sam, particularly with the New Deal in the striped trousers and plug hat, is out for the scalps of profiteers. The steel industry has been under fire during the peace of recent years for collusive bidding on Government contracts, for alleged failure to meet labor half way, for the basing point system of quoting steel, etc.

In the second place, manufacturers will have an eye on the aftermath when hostilities cease. The enormous surpluses of the war in steel and other metals were a plague for several years after 1918. There will now be a tendency to guard against excessive surpluses. In the third place, the world has had a long time to prepare for the present war and large stocks of metals have been accumulated close to firing lines.

Again, the world has gone far in developing substitutes in the past twenty-five years. If steel becomes scarce, automobile bodies can be made of plastics, for instance. High prices for tin have caused substitution of bottles for canned food and beverages, paper and cardboard for tobacco, etc.

Again the world's potential supply of scrap steel and metals is larger, with allowances for natural growth of populations, than during the World War. There are more obsolete office buildings with steel framework, more bridges, more freight cars that can be scrapped. Light steel scrap can come from old refrigerators, gas ranges and oil storage tanks.

So far the main difference in behavior of the metals now and during the World War is that this time prices have gone up at the start instead of declining as during the early months of the World War. Where it took two years of the World War to bring maximum prices, the top should be reached much sooner this time, perhaps within nine months, assuming with the British that this is to be a three-year war.

Already the price of tin has advanced from 50 cents to 75 cents per pound. Manganese ore has risen from 30 cents to 50 cents per unit, as this is written. Quicksilver has advanced from $85 to $165 per flask of 76 pounds.

But these are exceptions and have special reasons behind them. Copper, on the other hand, rose from 10½ to only 12 cents per pound. The United States Steel Corporation announced 20 days after the new war started that fourth quarter prices will be *unchanged*. Thus in the more important metals, though the tendency is plainly towards higher prices, a most conservative course is being pursued.

The theme of this article, as the reader has surmised by now, is that price advances will be conservative on the whole and the impression is that the extreme advances of the World War will not be duplicated. Bearing out this argument is the physical set-up in the steel industry. Steel plants today are magnificent streamlined wizards of production. Continuous mills can turn out steel with a speed undreamed of twenty-five years ago.

The quality of steel has been improved over just the past two years enough to allow automobile tops to be stamped out in one piece and one operation—with the simplicity that grandma used to stamp out fancy cookie shapes from dough.

Bottlenecks in the steel industry have been eliminated. Pig iron is no longer allowed to cool at the steel mill but continues on in the the open hearth furnace. The Bessemer converter has recently been improved to allow of fool-proof control of processes, whereas formerly it depended on the dubious eyesight of some old steel veteran. Steel makers have thoughtfully saved, not scrapped, semi-obsolete mills for emergencies, and some of these were started up in late September. In short, if there is to be high-priced steel, it will not be because of shortage, as in the World War.

The following steels and metals should be in best demand if and as the war continues. Tin plate, now enjoying a special boom, for canning soldiers' food; steel plates for the construction of hulls for ships; steel rails and cars so that the carriers can transport more goods; steel scrap and more steel scrap; pig iron and semi-finished steel which can be manufactured into the finished form desired; special light steels for airplane parts; automobile steel for trucks and other soldiers' transport.

Continued on page 77

When You Buy
MOTOR VEHICLE EQUIPMENT

check it with the legal requirements of the states in which it is to be operated

R. E. PLIMPTON

IT is a misdemeanor, in most states, to operate any motor vehicle or combination of vehicles "which is in such unsafe condition as to endanger any person, or which does not contain those parts or is not at all times equipped with such lamps and other equipment in proper condition and adjustment as required" by various provisions of the existing statues or of rules and regulations duly promulgated under the statutes. The laws often specify that the use of additional parts and accessories not inconsistent with the statutory requirements is not prohibited.

Some kinds of equipment, such as head and tail lamps, are required on all motor vehicles. Clearance lamps, turning signals, warning lights, must be installed on or carried by commercial vehicles, which because of their size and weight are thought to need additional equipment as compared with the ordinary passenger automobile. Safety is thus the prime consideration, with the tendency to bear down more heavily perhaps on the buses and trucks operated as public carriers, and on the larger or heavier privately-owned trucks.

New safety requirements are often introduced gradually: that is, they are made applicable to vehicles manufactured after a specified future date, or owners are given several months' advance notice before changes in existing vehicles are mandatory. To illustrate the current requirements for newly-purchased private trucks, the accompanying tables and chart are presented. These are derived from a digest of state statutes, made by the National Highway Users Conference. Action taken in regard to equipment by 1939 sessions of the legislatures is included, when available, but cannot be taken as complete, since in some states the legislatures have not yet adjourned. An effort has been made to outline information of the most direct interest to fleet owners of trucks. The states are arranged on a regional basis, to permit ready comparison of requirements applicable in adjoining legislative jurisdictions.

Brakes and Performance

During the present year four states (Ind., Nev., W. Va., and Wyo.) have joined the ranks of those requiring service brakes on all wheels of new motor vehicles. A number of others, as the tables indicate, have adopted another Uniform Code[1] provision, that the brakes must operate on at least two wheels.

Semi-trailers must be fitted with brakes that can be controlled by the driver of the tractor, in about half the states. In a few cases this applies to all such trailers. More generally such brakes are essential only when the gross weight of the semi-trailer exceeds a specified figure, such as 1,500 or 3,000 lb. Other methods of determining when brakes must be used are also in vogue: for example, a minimum unladen weight or a minimum carrying (rated) capacity may be specified, or the minimum length of the combination, or its total gross weight. Unless otherwise indicated in the tables, the "Semi., G. W." column shows the gross weight above which semi-trailers must be fitted with brakes.

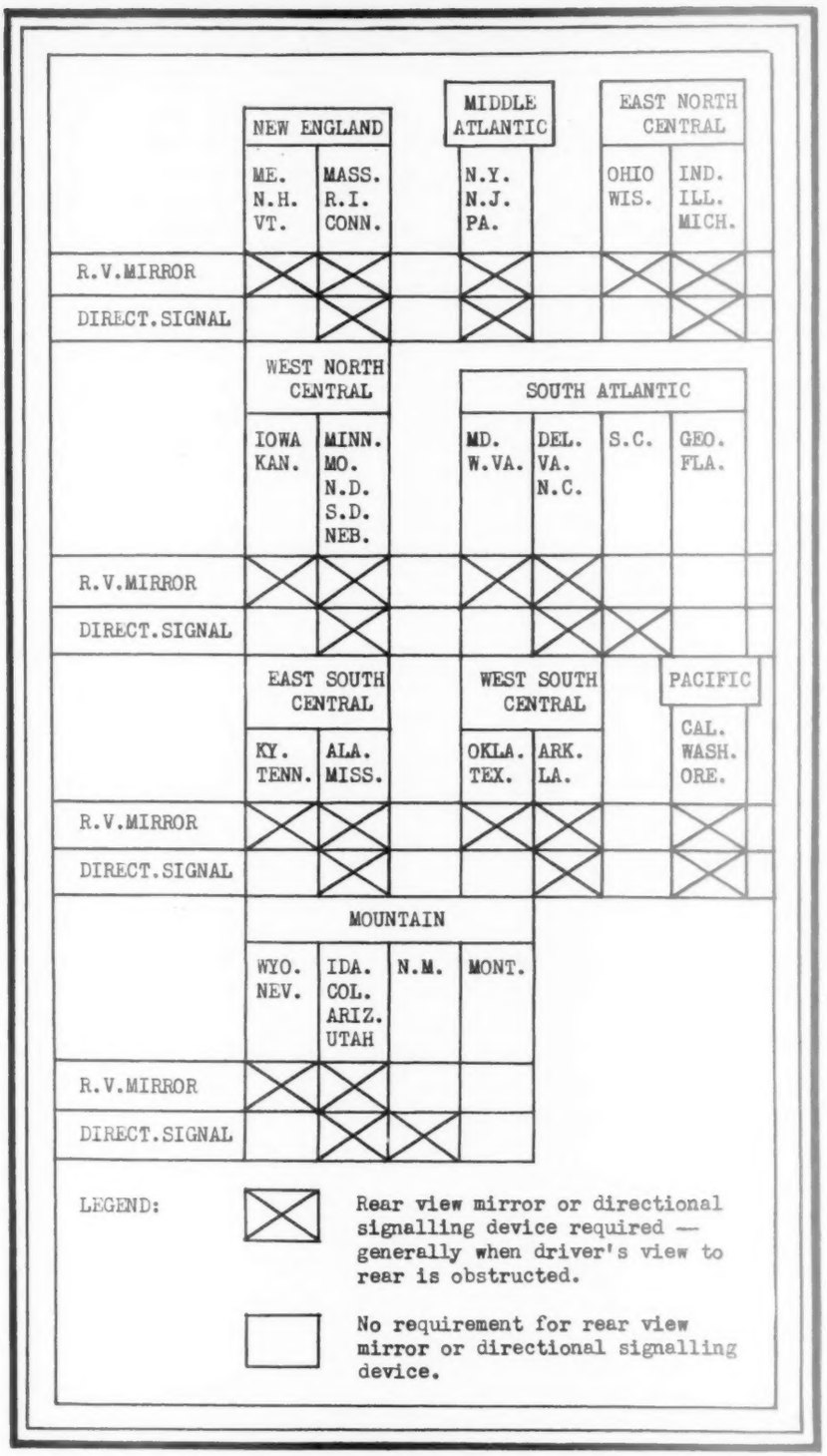
Even when brakes on the semi-trailers are not mandatory it is frequent practice to require that combinations must be equipped with brakes on one or more of

[1] *As prepared by the National Conference on Street and Highway Safety.*

their units, capable of stopping them in distances applicable to single vehicles.

These stopping distances are shown in the tables, for a speed of 20 mile per hour. Some states make no distinction between two or four (all) wheel brakes, so that at a particular speed the stopping distance is the same for either design. Others require a shorter distance for four-wheel brakes, than for the two-wheel type. Instead of distinguishing between four- and two-wheel brakes, the Uniform Code sets forth two classes: Vehicles or combinations of vehicles having brakes on all wheels; and vehicles or combinations not having brakes on all wheels. For these the Code stopping distance, at 20 m. p. h., is 30 and 40 ft. respectively.

To determine whether a vehicle complies with the law as respects stopping distances, the Uniform Code recommends the use of an approved instrument or testing machine. A few fleet operators use such devices, and a few enforcement authorities. More often an attempt is made to check the distance over a measured course. There is a great deal of uncertainty as to the proper methods of measuring brake performance. The American Standards Association has had a committee of specialists at work for a year on the problem and hopes in another year "to accumulate and analyze sufficient data on which to base brake testing standards."



Identification of Larger Vehicles

Legislative requirements for such fundamentals as brakes, head and tail lamps are usually the same for passenger cars and for commercial vehicles. But in most states the larger trucks must have special marking, something to warn drivers of other vehicles to keep clear. Clearance and side-marker lamps, with color and position specified, may be required, while frequently flares and red flags must be carried and displayed on the highway when the vehicle must be left standing there. The accompanying tables show the colors to be used on front, side and rear clearance lamps, also the kind of flares or other such warning signals.

Width of truck is the common test for the legal use of clearance lamps. Many states demand them on all trucks of 80 in. or more width. Length is often the determining factor in the case of side-marker lamps, as when that dimension exceeds 20 or 30 ft. A number of states require bar lights (three lamps in a row, mounted at the top of cab or body) at front and rear, in addition to the front and rear clearance lamps. The latter must be

SAFETY EQUIPMENT REQUIRED BY STATE LAWS

State	Brakes and Performance: No. Whs.	Stop, 20 mph.: 2 Wh.	All Wh.	Semi G. W.	Clearance Lights or Reflectors, Type: Front	Side	Rear	Type Warning Signal	Safety Glass, Year	Windshield Wiper
NEW ENGLAND STATES										
Me.	NR	45	30	NR	G-A-T	NR	R-T	NR	1937	NR
N. H.	NR	37	22	3000	G-T	NR	R-r	Fl	1936	NR
Vt.	NR	NR	NR	NR	G-Cl	NR	R-Cl	Fl-Fg	1936	M
Mass.	2B	50	40	NR	G-Cl	NR	R-r	NR	1936	M
R. I.	2B	50	50	Tr	W-A-r	NR	R-r	Fl-EM	1938	NR
Conn.	NR	40	40	4000	W-A-T	NR	W-R-A-T	Fl-EM	1937	M
MIDDLE ATLANTIC STATES										
N. Y.	NR	NR	NR	1000V	Y-T	NR	R-T	FC-L[1]	1935	NR
N.J.	All	45	30	3000	NR	NR	R-r	FC-EL[2]	1935	M
Pa.	All	40	30	1000V	A-B	A-T-Fr	R-B	FC-EL-Fg[3]	1935	M
					A-Cl	R-T-Rr	R-Cl	[redacted]		
EAST NORTH CENTRAL STATES										
Ohio	NR[4]	NR	NR	NR	NR	NR	R-t-Tr	NR	1936	NR
Ind.	All	40	30	1500	G-T	NR	R-T	Fl-EL-Fg[5]	1936	NR
Ill.	All	40	30	1500	G-BR	NR	R-B	Fl-EL[6]	1936	M
Mich.	All	40	30	3000	A-Cl	A-l-Fr	A-B	NR	1934	M
							R-l			
Wis.	2B	50	50	NR	G-Bl-A-T	NR	R-T	Fl-L[7]	1936	M
WEST NORTH CENTRAL STATES										
Minn.	Two	40	30	1000	W-A-Cl	W-A-Cl-Fr	R-Cl	Fl-EL-FY	1938	M
						R-Cl-Rr				
Iowa	All	45[8]	45[8]	3000	W-Cl[9]	W-t-Fr[9]	R-t	Fl-EL-Fu	1935	NR
					W-B[9]	R-Cl-Rr	R-B			
Mo.	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
N. D.	2B	NR	NR	NR	W-l	NR	R-Cl	NR	NR	M
S. D.	2B	33	33	NR	W-l	NR	R-Cl	Fl	NR	NR
					G-B		R-B			
Neb.	2B[10]	40	35	NR	G-A-T	NR	R-T	Fl-FY	NR	M
Kan.	2B	40	30	NR	A-Cl	A-T-Fr	R-Cl	Fl-EL	1938	M
					A-B	R-T-Rr	R-B			
SOUTH ATLANTIC STATES										
Del.	2B	40	30	4000	W-Cl	G-Cl-Cb	R-Cl	Fl-EL	1937	M
Md.	NR	30	30	NR	W-N-Cl	NR	R-Cl	R-Y/CS	1937	NR
Va.	NR	45	25	4000C	A-Cl	NR	R-Cl	Fl-Fg	1936	M
W. Va.	All	..	..	3000	W-Tf	NR	NR	NR	1937	NR
N. C.	NR	45	25	4000	A-Cl	NR	R-Cl	Fl-L-Fg	1936	M
S. C.	All	40	30	3000	A-Cl	NR	R-Cl	NR	1937	M
					A-B		R-B			
Geo.	NR	NR	NR	NR	NR[11]	NR	NR[11]	NR	NR	NR
Fla.	Note[12]	NR	NR	NR	NR	NR	NR	NR	NR	NR
EAST SOUTH CENTRAL STATES										
Ky.	2B	40	30	Note[13]	W-G-Cl	NR	R-Cl	Fl-EL	1939	M
Tenn.	All	40	30	1500	W-T	NR	Y-R-T	EL[14]-Fg	NR	NR
Ala.	2B	NR	NR	NR	W-Cl	NR	R-Cl	CS-Fg	NR	NR
Miss.	All	40	30	Note[13]	G-Cl	G-T-Fr	R-Cl	Fl-EL-Fg	1939	M
					G-B	R-T-Rr	R-B			
WEST SOUTH CENTRAL STATES										
Ark.	All	40	25	1500	G-Cl	G-T-Fr	R-Cl	Fl-EL	1938	M
					G-B	R-T-Rr	R-B			
La.	NR	45	45	1500[15]	W-Cl	NR	R-Cl	Fl-Fg	1937	NR
Okla.	All	45	30	3000	W-Cl	W-t-Fr	R-Y-T	EL[14]-Fg	1937	M
						R-t-Rr				
Tex.	2B	45	45	NR	W-T	NR	R-Y-T	Fl	NR	NR
MOUNTAIN STATES										
Mont.	NR	NR	NR	NR	[17]W-T	NR	R-T	NR	NR	NR
Ida.	NR	NR	NR	1500V	A-Cl	A-Cl-Fr	Y-R-Cl	Fl-EL	NR	NR
						R-Cl-Rr				
Wyo.	All	40	30	1500	A-Cl	A-t-Fr	R-t	EL[14]-Fg	1937	M
						R-t-Rr				
Colo.	All	55	40	1500	A-Cl	A-Cl-Fr	R-Cl	OB-Fu-Fg	1937	M
					A-B	R-Cl-Rr	R-B			
N. M.	2B	NR	NR	Note[13]	NR	NR	R-r	OB-Fu-Fg	NR	NR
Ariz.	2B	NR	NR	NR	W-Cl	NR	R-Cl	NR	NR	M
Utah	2B	NR	NR	NR	G-Cl	G-T-Fr	R-t	NR	1936	M
					G-B	R-T-Rr	R-B			
Nev.	All	40	30	Note[3]	A-Cl	A-Cl-Fr	R-Cl	NR	NR	NR
						R-Cl-Rr				
PACIFIC STATES										
Wash.	All	45	35	2000	Y-Cl	NR	R-t	EL-OS	1938	M
Ore.	2B	37	37	NR	A-Cl	A-Cl-Fr	R-t	Fl-EL-Fg	NR	M
						R-Cl-Rr				
Cal.	NR	37	37	NR	A-Cl	A-Cl-Fr	R-Cl	Fl-L-WL[16]	1936	M
						A-Cl-Rr	R-r			

NOTES

NR —No requirement
M —Mandatory equipment
A —Amber
G —Green
R —Red
N —Tinted color other than red
W —White
Y —Yellow
Bl —Blue

B —Bar lamps, three, 6 to 12 inches apart
BR —Bar lamps, three, 6 inches apart
T —Lamp or reflector
t —Lamp and reflector
r —Reflector
Fg —Red flag, not less than 12 inches square
FY —Yellow or orange colored flags, 24 inches square, for use in daylight hours.
Fu —Fusee required until flare can be lighted; also red flag for daylight warning

Fl —Oil burning warning signal (flare), usually of approved type
Cl —Clearance lamp
FC —Flaring candle or torch
L —Lantern
EL —Electric lantern
CS —Caution signal, with friction-cap ignition, for use with disabled vehicle with disabled lighting.
OB —Oil-burning torch, on trucks of more than 1-ton capacity, must burn at least 12 hours
WL—Warning lights or approved reflectors
EM—Emergency lighting devices to be carried on each commercial motor vehicle of more than 2,000 lbs. rated capacity, and on each combination of tractor and trailer.
All —On all (four) wheels
2B —Brakes must operate on at least two wheels
Tr —Semi-trailer to be fitted with suitable brakes if part of a combination exceeding 28,000 lbs. total gross weight
V —Minimum unladen weight (chassis and body) for which brakes are required
Cb —Combinations over 33 ft. long
Fr —Front
Rr —Rear
Tf —On front of semi-trailer

1.—Must be carried on every combination and on trucks of more than 4,000 lbs. unladen weight; burn for at least 8 hours.
2.—Must be carried on any commercial motor vehicle of over 5,000 lbs. unladen weight; burn for at least 12 hours.
3.—Must be carried on trucks or combinations of 11,000 lbs. or more gross weight; burn for at least 8 hours.
4.—But each motor vehicle must have "sufficient brakes to control it at all times."
5.—For use in daytime, except when weather conditions are such as to produce low visibility, caution signals must be burnt.
6.—Must produce warning light continuously for 12 hours.
7.—Fusees or lights to be kept burning entire time (after dark) vehicle is standing on country highway.
8.—Stopping distance, 30 ft. for vehicles of 5,000 lbs. or less gross weight.
9.—Yellow or amber color also permitted.
10.—Power or booster brakes required on trucks of more than 12,000 lbs. gross weight.
11.—All motor vehicles must be equipped with "front and rear" reflectors.
12.—Vehicles exceeding 16,000 lbs. gross weight to be "equipped with vacuum booster brakes, electric brakes, or air brakes."
13.—Every semi-trailer must be equipped with brakes that may be operated by driver of tractor.
14.—Instead, flares may be carried, provided fusees are also kept ready for use.
15.—Minimum "net load weight" for which brakes are required.
16.—Applies to every truck having unladen weight of 4,000 lbs. or more, and to every truck-tractor.
17.—Yellow and green also permitted.

mounted as near the top corners as possible, to mark the extreme width and height of the vehicle. It is customary to use red on all lamps at or near the rear. At the front, as the table shows, green, white, amber or yellow are permissible, a number of states giving operators the choice of two or more of these colors. Maryland is most generous perhaps, permitting use of any "tinted color other than red," in front clearance lamps. California specifies a three-way lamp at each side, front and rear, each one to display a green light visible to the front, rear and side of the vehicle on which it is located.

Flares or other warning lights must be carried on all trucks in the majority of the states. The laws further require that such signals must be used whenever the truck or combination is disabled on the traveled portion of the highway. Warning lights must be displayed during the hours when vehicle lamps must be lighted; red flags during the daylight hours. If the vehicle is carrying flammables, open-burning signals are forbidden, and the warning must be conveyed by electric lanterns or reflectors, red in color. Many state laws also provide that if flares are carried, fusees also must be available, the latter to be used immediately after the vehicle has stopped, until the flares can be lighted and put into place.

The lighter trucks need not carry or display flares or flags in a few of the states. The line of demarcation is drawn in a variety of ways. Delaware applies its flare law to trucks having a width at any part in excess of 80 in.; California, to those having an unladen weight of 4,000 lb. or more; Connecticut, to those with manufacturer's rated capacity in excess of 2,000 lb., and Pennsylvania to trucks or combinations with gross weight of 11,000 lb. or more.

Safety Glass on New Vehicles

Under the heading "Safety Glass, Year" the tables present a chronological history showing the date when safety glass was first required on all new vehicles. Thirty-three states have now passed safety-glass laws, according to available information. In two of these (Kentucky and Mississippi) the laws became effective this year. Michigan was the pioneer; since 1934 that state has forbidden the operation of any motor vehicle upon a public highway "unless such vehicle is equipped with shatter-proof or laminated glass or any glass manufactured or fabricated of sufficient consistency to provide against shattering." Later laws as pressed by other states usually specify that the windshield, doors, windows and partitions must be equipped with safety glass of a type approved by the motor vehicle commissioner or other designated authority.

In the last two or three years there has been a tendency to require that all replacements shall be with safety glass. Seven states (Cal., Iowa, Md., Minn., Miss., Okla. and Wash.) forbid owners procuring or any one else installing, any glass other than safety glass for replacements.

In addition to requiring glass that will lessen the likelihood of injury, when cracked or broken, the laws of Nebraska and New Jersey contain provisions relating to the visibility of the material. Safety glass must "successfully withstand discoloration due to exposure to sunlight or abnormal temperatures over an extended period of time." So reads the Nebraska law in part. New Jersey prohibits the driving of any motor vehicle "equipped with safety glass which causes undue or unsafe distortion of visibility or equipped with unduly fractured, discolored or deteriorated safety glass."

Windshield Wipers

The 1938 edition of the Uniform Code provides (Section 152b): "The windshield on every motor vehicle shall be equipped with a device for cleaning rain, snow, or other moisture from the windshield, which device shall be so constructed as to be controlled or operated by the driver of the vehicle." This provision has been adopted, insofar as it required the use of a wiper, in the states as indicated in the right hand column of the accompanying tables. The majority of these also require control of the wiper by the driver. In Idaho new vehicles must now be equipped with a double wiper, each unit capable of cleaning a surface of not less than 120 sq. in.

Mirrors and Turning Signals

To insure safety when making turns the driver must be able to see to the rear of his vehicle, and in addition, it should be possible for others to see a signal of his intention to turn. The rearview mirror helps him to see to the rear, while a directional signal (lamp or other device) warns others of his intention to turn. One or the other of these devices (mirror or signal) is required in all but three of the states. Georgia, Florida and Montana depend upon the driver to look out for himself, it would appear. But as the accompanying chart indicates,

Continued on page 76

No. 4 in a series of articles on the basic features and recent developments in design and operation, essential to efficient procurement of automotive equipment.

Next Month: Truck Bodies

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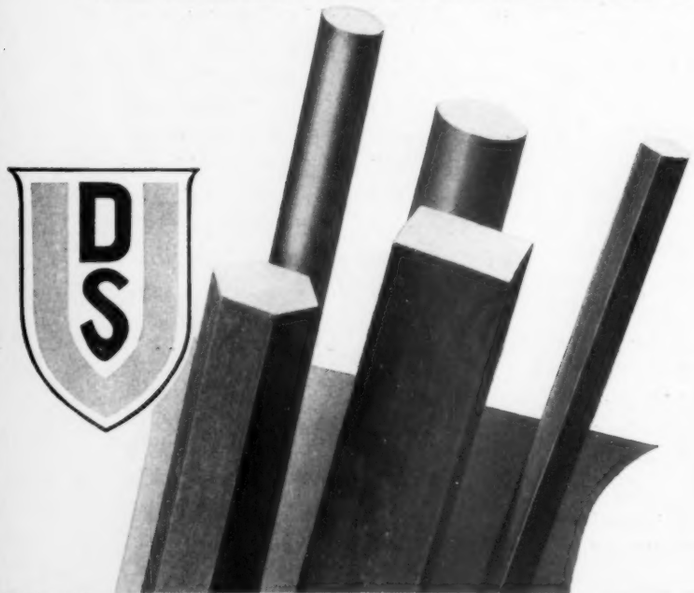

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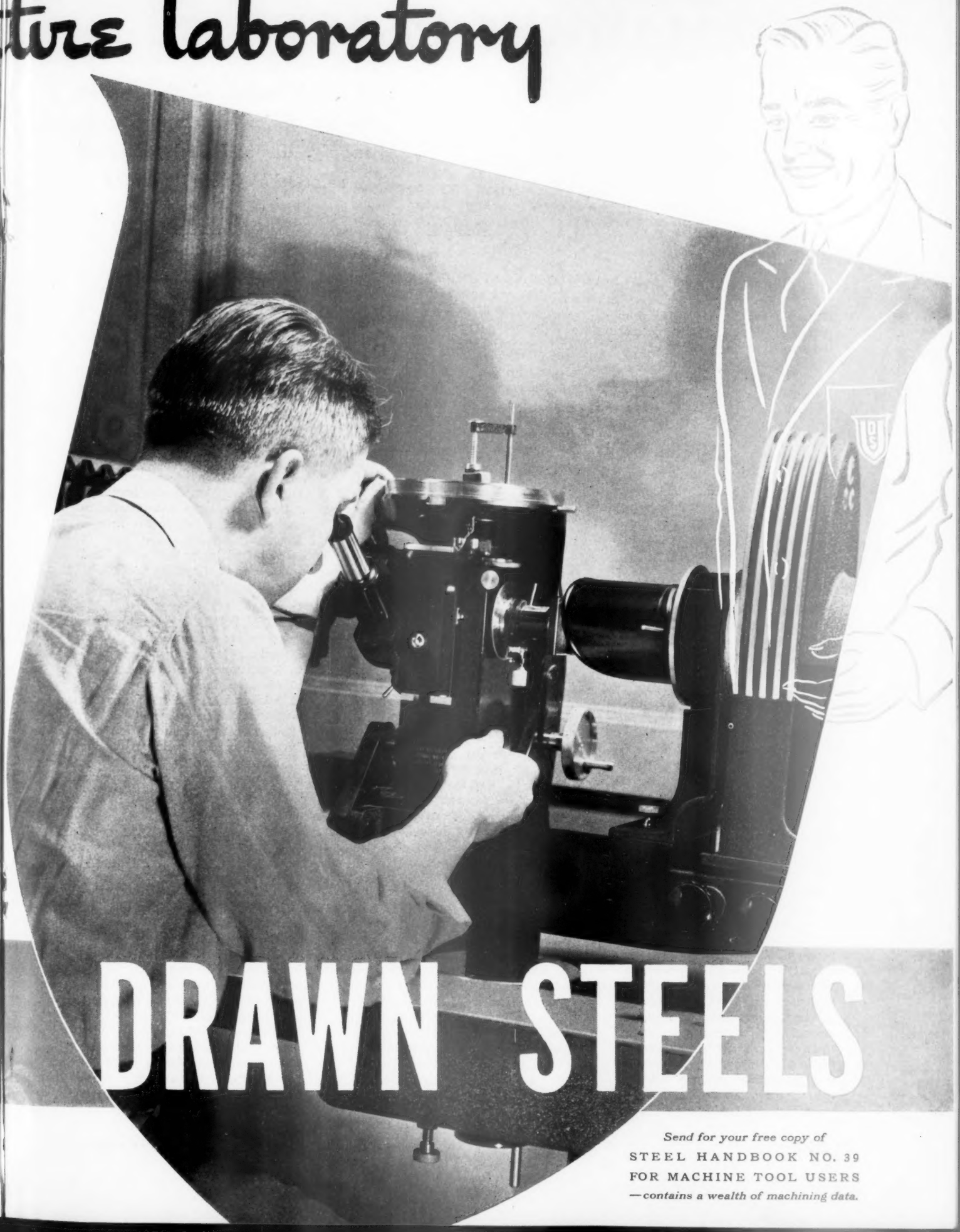

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THE MARKET PLACE

A quick review of the market noting major developments in supply, demand and prices of selected basic commodities

Supply | **Demand** | **Market**

BURLAP

CALCUTTA STOCKS of burlap at the first of September were sharply down by 11½% from the previous month, to slightly more than 366 million yards, and were down further to 295 million yards by the first of October. Offerings are strictly limited. Mills have increased their schedules from 45 to 54 hours weekly. Cargos are being routed around Cape Horn, entailing a delay of several weeks in delivery to the U. S., and cargo space is completely booked to the first of the year. U. S. Stocks were slightly up after several months of successive declines, equal to 5 months supply.

U. S. CONSUMPTION of burlap turned upward in August after four months of decline, but are still short of the corresponding figure for last year. Total cutup for the first 8 months of 1939 mounted to 432 million yards, compared to 439 million yards in 1938. Demand is active, but elicits few bids on spot business. An appreciable volume of potential demand is being diverted to cotton fabrics.

BURLAP QUOTATIONS rose daily in the first half of September, reaching a peak on the 16th. In this period the list rose 265 points, standard 40-10½s advancing from 5.75 cents per yard to 8.40 cents, spot. There was a recession in the third week, and the market steadied. A portion of the loss was regained in the closing days of the month, showing a net gain of more than 2½ cents. In view of the limited offerings these prices were somewhat nominal, but fairly reflected the market tone. Futures followed the spot market in the initial rise, but by the first of October the normal spread of 35 to 40 points under spot prices had lengthened to 65 points.

COAL

OUTPUT of bituminous coal expanded further in September, and reached a peak for the year at mid-month at 8,900,000 tons. Present plans call for maintaining that rate through the first quarter of 1940 on the basis of domestic needs plus normal exports; the latter factor being subject to increase if British and German exports are cut off. Industrial stocks are higher. Coke supplies at steel centers are limited. Lake dumpings are at all-time high records.

INDUSTRIAL consumption of coal increased in virtually all classifications and was consistently broadening. There is a strong possibility that exports may double in volume from the present rate of 10 million tons per year, though demand for this source has not yet developed. Purchase for use, heavy Lake cargos, and stocking for industrial and commercial use, all contributed to the high demand.

COAL PRICES were stronger than for many months past. Bituminous prices advanced from 15 to 40 cents per ton. Several grades of West Virginia coal were quoted at minimum code levels for the first time, and a few went slightly above those minimums. Anthracite advanced 15 to 30 cents per ton for rail shipment and 25 to 40 cents at tidewater. Beehive coke was up a dollar a ton at the end of the month.

COPPER

THE ISSUANCE of copper statistics was suspended last month. Soundly based estimates, however, indicate that domestic production is running around 62 to 64 thousand tons monthly. No expansion is in prospect, though sales might be increased. Consumers' stocks and orders are estimated as equivalent to 5 or 6 months requirements, compared to 3 months normal supply. The surplus appears to have been shifted from producer to user, and producers have no desire to further increase the total tonnage of available metal and to encourage overbuying.

BUYING was brisk throughout the month, approaching the high levels of June and July despite higher prices. The demand factor was the more noticeable because of producers' apparent reluctance to sell, leaving a large share of the business for the custom smelters. Actual consumption was also at a high rate as brass industries expanded their operations to 100% of capacity for the first time since the World War. A month earlier, the rate was 75%, then a two year high.

THE RISE in copper prices at the beginning of September carried quotations to 12½ cents, but after the first week, the price settled to 12 cents and stabilized at that level, as scrap prices were also adjusted to the 12-cent price. In the first week of October, quotations again advanced and the 12½-cent price was re-established. Great Britain has pegged the price of copper produced within the Empire by setting a maximum price of 52 delivered, equivalent to 9 or 10 cents per pound, the variation being due to erratic sterling exchange.

Supply	Demand	Market
COTTON		
THE cotton crop report passed almost unnoticed in the exciting September textile market, and in the knowledge that stocks of the staple in public storage and compresses are equal to any requirement. The crop is rated at about 11.8 million bales, or 1% under the 1938 total. Mill inventories were sharply down to 1 month's supply at the higher consumption rates. The 25% curtailment of spindle operation was abandoned and after the first week of heavy sales no deliveries earlier than November or December were promised.	THE heaviest buying wave since early in 1920 taxed the textile markets in the first weeks of September, several successive days witnessing sales of more than 150 million yards. Industrial constructions were the first in demand, led by burlap substitutes. Print cloths and apparel fabrics followed close behind. The basic market was relatively steady, but with advancing prices buyers continued to cover well ahead of immediate needs. Most mills are sold up to production for the balance of the year, and some into the first quarter of 1940.	THE price of raw cotton advanced in September from 8.28 to 8.86, the use being fairly steady and experiencing only one setback in the middle of the month. The closing price was still under the levels of two months earlier. Gray goods and finished cloths rose notably with successive advances of ⅛ and ¼ cents per yard. The gains ranged from ⅜ to 1 cent on gray goods, and on finished cloths from ¾ on broadcloth and sheeting to 2 cents on lawns and 2¾ cents on sateen.
IRON and STEEL		
STEEL output was sharply up in September, attaining a 2-year high rate of 83.8% in the closing week, and 88% going into October. It is now estimated that a rate of 95% may be reached before the end of the year. Advances are now said to be limited chiefly by the ability to bring idle furnaces and rolling mill equipment into operation, and this work is being pressed.	DEMAND was broad; while automobile and rail orders led in volume, other items contributed to an impressive total. There is considerable buying for users' inventories, which are being substantially increased. The wave of actual buying apparently passed its peak in September but there is pressure for deliveries, which must be completed during this quarter at present prices.	FOURTH quarter steel prices were reaffirmed without change, but some revisions were made before the end of the month—in cut nails, bolts and nuts, and the entire warehouse list. Pig iron was up $2 a ton to $23.00, scrap up to $22.50. Other steel materials such as fluorspar, tungsten and ferromanganese advanced from $2.50 to $20.00 per ton. It was not surprising therefore to find heavy steel prices marked up $5 a ton by one independent producer.
LUMBER		
LUMBER output went to higher levels in September, 2% under the corresponding period of 1937 and 22% ahead of 1938. Shipments were 9% and 28% higher respectively. For the year to date, production is up 18% and shipments 16% ahead of last year.	NEW business in September was at the highest level since 1930, and 42% above production. Hardwoods shared in this situation to a greater extent than has been the case recently, as shipments exceeded production by 24% and new orders exceeded production by 146%.	LUMBER prices firmed in September, with moderate advances in softwoods bringing quotations back close to the year's highs. The advance in hardwoods was more defined, as two mark-ups raised prices by 7% to the best levels of the year. The advances were well maintained.
NAVAL STORES		
THE naval stores markets were more than seasonally active in September. Stocks of both rosin and turpentine rose slightly at Southern markets, but supplies of popular grades were very short, particularly in the darker gum rosins and in steam distilled wood turpentine.	DOMESTIC demand was in good volume, particularly in the early part of the month. Export inquiry was also good though actual sales were not heavy. South American inquiry was most active.	PRICES advanced all along the line. Gum turpentine was up 3½ cents per gallon; wood turpentine up 6 cents, a nominal quotation with stocks practically nonexistent. Dark rosins ranged from no change to $1.05 advance per barrel; medium grade rosins from 50 to 80 cents advance; fine grades from 20 to 30 cents advance; wood rosins up 95 cents.
PAPER		
THE rate of paper production rose in September to 92.2% the highest ratio recorded since this figure has been issued, five years ago and comparable to the first half of 1937. Paperboard operations rose to 79%. Canadian exports of pulp and paper are now under strict regulation, but producers have jointly pledged themselves to maintain a continuous supply.	DEMAND was brisk and well diversified, the most active items being kraft, tissue, news and paperboard. Manufacturers are making a concerted effort to discourage speculative buying and to keep deliveries on a stable month-to-month basis.	PAPER prices continued to firm. The $50 price on news has been extended for the first quarter of 1940. Several items of kraft are quoted 2½ to 5 cents per cwt. higher than a month ago. Paperboards are up $7.50 to $10.00 per ton. Mechanical pulp is up $6.00 to $7.00 per ton; sulphite pulp up 40 cents and kraft pulp up 25 to 30 cents per cwt.

Supply	Demand	Market
PETROLEUM		
AT THE beginning of September, crude oil stocks and production reflected the full effect of the shut-ins in Texas and other states. Runs to stills continued fairly heavy, but with daily average production down to 1,677,000 barrels, the supply of crude in storage was rapidly depleted. Output mounted rapidly, however, as regulation was relaxed, and spurred by active demand and better prices. By mid-month, daily average output had doubled, and by the end of the month it was up to 3,681,050 barrels. On October 1st the week-end shut-ins were discontinued, and drilling of new wells was up to the high levels of early summer.	DEMAND was strong in virtually all products. The Bureau of Mines estimate of crude oil requirements for October was set at 3,590,300 barrels daily, up 79,600 barrels from September, and 3.5% greater than actual consumption a year ago. The seasonal demand for heating oils is now being felt, and there has been higher industrial consumption of heavy fuel oils and lubricants.	THE MARKET tone was completely reversed from the weakness of a month earlier, and chiefly on domestic factors. Just before the middle of September, exactly a month after the August break in crude prices, a series of advances took place, affecting kerosene, bulk heating oils, Diesel oil, gasoline, and bunker fuel oils. A week later, prices on Pennsylvania lubricants were again raised, with Mid-Continent grades following suit. All of the advances were well held, and supported by good demand. At the end of the month, the possibility of an advance in crude prices was strongly considered.
RUBBER		
STOCKS of crude rubber in the United States dwindled to 161,477 tons at the beginning of September, the smallest total in nine years, and representing only a little more than three months supplies. Offsetting this factor is the assurance of the Rubber Manufacturers Association, after conference with governmental officials of this country and Great Britain, that ample supplies would be available. More concretely, the tonnage afloat to U. S. ports is the highest since the record rate of November, 1937.	THERE was steady factory buying of rubber in September, but the greatest activity of the month in this market was the speculative fever of the opening week, which subsided when a good volume of offerings from the Far East appeared. Trading in the second half month was listless and routine. Tire production is at a high rate, sales for the year being estimated at 50 million units, a 20% increase from 1938.	SPOT quotations ran up rapidly in the war boom of early September, going from 16⅞ to 25 cents in the first week. This was followed by another week of fluctuation between 20 and 24 cents, after which prices held for 10 days at 22½ and sagged to 20¾ at the 1st of October. Tire prices firmed, and price shading practically disappeared. A new list is due on November 1st, and moderate adjustments are in order, since the present list is presumably based on 16-cent rubber.
TIN		
TIN stocks were low, and offerings limited, in September. Production for the first 8 months of 1939 was down more than 10% from the previous year, in line with lighter world consumption. With the development of the buying panic last month, and war demand, the International Tin Committee raised the 3rd quarter export quota from 80 to 100%, making this ruling retroactive to July 1st and tending to give a free market condition.	WORLD apparent consumption of tin for the first 8 months averaged 12,440 tons per month, compared to 12,600 tons a year ago. Its use has been broadening, however, with a larger vegetable pack that had been expected and an active production schedule in the automotive industry. Buying was feverish in the first half month, and continued good, but rather saner, throughout the month.	THIS most volatile of metal markets ran true to form in September, climbing dizzily from 48 to 75 cents in the first two weeks. After that first frenzy had passed, the price settled gradually to 56 cents on October 1st. Futures did not follow the spot market, the spread for December delivery being as great as 19 cents. The British Minister of Supply pegged Empire prices at £230 per ton, the pre-war level.
ZINC		
SURPLUS stocks of zinc are down to the low levels of last November, and consumers' inventories are likewise low. Production is being stepped up, but supply is still limited. A major factor in this situation is the Canadian embargo against shipments of metal from the Dominion.	BUYING was abnormally heavy, both for use and on the price advance. Unfilled orders at the beginning of September were less than 45,000 tons, and were over 80,000 tons at the end of the month. Galvanized sheet operations were sharply up, reaching a new high for the year at 74%.	THE price of zinc was 4.75 cents on September 1st. By the 5th of the month it had climbed to 5.75 cents. A week later it was up again, to 6.25, going on to 6.50 on October 1st. The "average price" basis for sales reappeared in this commodity, and a considerable volume of September buying was on that arrangement. The price of concentrates was up $8.50 per ton, to $40.00.

How LINSEED OIL *comes to* MARKET

FRANCIS A. WESTBROOK

FLAXSEED, from which linseed oil is manufactured, has had an average annual consumption in the United States, during the past few years, of approximately 25 million bushels. Several years ago it was as high as 45 million bushels, the recent falling off being chiefly a reflection of generally depressed business conditions. In the last twenty years, the amount raised in this country has varied from about 5 million to 31 million bushels. The average for the past ten years has been slightly better than 12 million bushels per year, or about one-half of domestic requirements, though in five of these years the crop was about 8 million bushels or less. In 1938 it was at approximately that figure, but according to the August 1939 estimates, the present crop will amount to 15,750,000 bushels. This increase appears to be due to the encouragement given by the government to farmers in the Northwestern producing states—Minnesota, North and South Dakota, and Montana—because in 1938 this appeared to be a more attractive crop than wheat.

Besides our domestic production, flaxseed is grown extensively in Argentina, India, Canada, China, Russia, and various other countries. Practically all of the seed imported into the United States comes from Argentina. It is harvested there in December and January, and in this country during July and August.

Since it is a commodity with a world market, and we are dependent on imports for a substantial portion of domestic requirements, the world figures on crops and on current demand for linseed oil naturally influence the price, but the domestic crop is one of the major factors in this consideration. The U. S. Government issues a crop prediction each year on July 10, and from that date on the crop and weather conditions are closely watched, exerting either bearish or bullish influence on the price of the oil.

The seed is crushed between heavy rolls in preparation for the hydraulic press.

Photographs by courtesy of Spencer Kellogg & Sons.

The Minneapolis Chamber of Commerce and the Duluth Board of Trade are the two grain exchanges which are the primary markets for handling the crops of the four states mentioned above. Within the past two or three years California has been producing more flax, and according to the estimate of the Department of Agriculture, this year's crop will be about three times greater than the previous ten year average. This is sold and used almost entirely on the West Coast. Texas has also stepped into the picture recently as a potential producer of flaxseed on a large scale.

In the northwestern producing area, the farmers do not specialize in flax, but plant it as a part of their general crop. It was formerly the custom to plant it as the first crop on newly broken land, but not much new land is being brought in at the present time. This explains the wide variation in crops, which depend on the extent of the acreage which the farmers may see fit to sow to flax, as well as on the weather conditions and consequently yield per acre.

From Crop to Crusher

When the farmer has grown his flax, he harvests it by combines and takes it to the country elevator, occasionally on consignment but usually on a direct sale basis. In the Northwest, the farmers' cooperative elevators have been developed to a very considerable extent. Line companies representing the larger crushers have a number of elevators extending throughout the producing country, and there are also independent dealers.

The price that the farmer receives for his flax is the current price at the Minneapolis or Duluth market, less freight to the market, and less the country elevator's margin, covering its cost of doing business and its profit. The elevator in turn hedges its purchases from the farmer by selling the seed for future delivery at Minneapolis or Duluth, generally using both markets according to whichever one has the more favorable quotations at the time.

When the country elevator has accumulated a sufficient amount of flaxseed to make shipment desirable, it is consigned to a commission man at either one of the markets. Upon arrival of the flax, it is inspected by federally licensed inspectors. The commission man also has a sample of the lot taken by independent samplers, and if he is not satisfied with the grade placed upon it by the federal inspector, he can appeal for a regrading. The standard commission for the broker is 1½ cents per bushel.

There are large crushing plants at Minneapolis, having a capacity of about 8 million bushels per year, procured chiefly through the local market. The flax from Duluth has generally been shipped to eastern crushing plants, but the situation has changed in the past ten years or so, until the eastern plants now get most of their material from the Argentine, purchasing through a number of firms which are in actual contact with the Argentine growers.

Extracting the Oil

The flaxseed is processed by the crushers for the linseed oil that it contains. It is first cleaned of chaff and foreign matter by blowing a current of air through it as it passes through a system of oscillating screens. The seed drops from the screens into large bins over the crushing rolls.

The rolls are usually 5-high, so arranged that the seed passes back and forth between each pair of rolls, thus receiving four separate crushings. Each roll weighs from one-half to one ton, and its full weight rests on the roll below, so that when the seed has passed through the machine it has been reduced to a very fine mesh.

In order to obtain the best yield of oil from the seed, it is necessary to break down the oil cells, which are so small that even the crushing does not break them. The finely ground seed is therefore dropped into tempering kettles, where it is heated evenly throughout, while being agitated with a small amount of steam. This releases the oil contained in the microscopic cells.

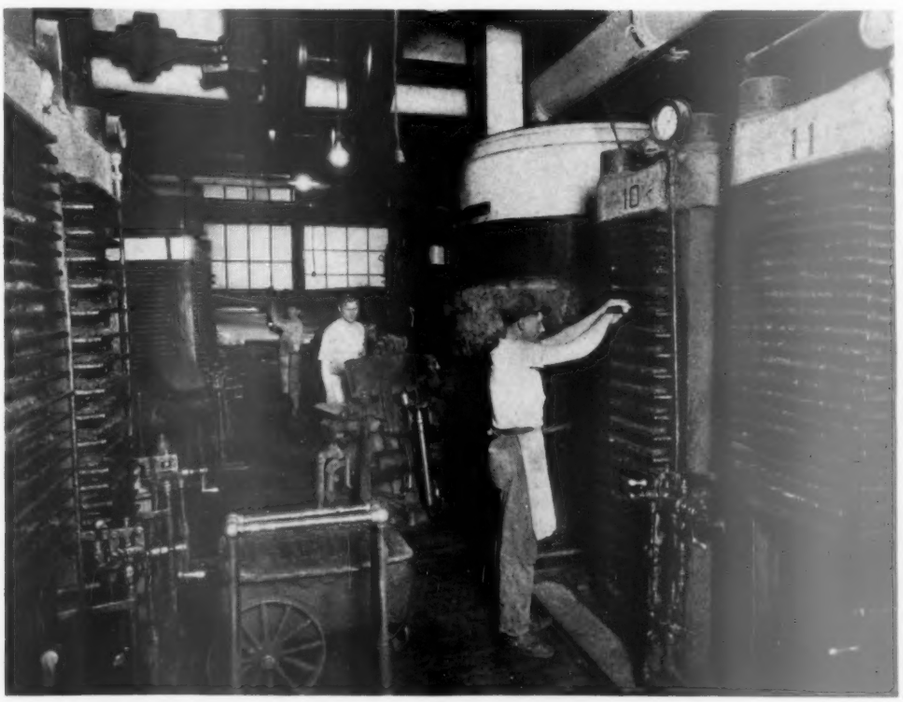
The mash thus obtained is then dropped from an opening at the bottom of the kettle into what is commonly called the "cake buggy." The latter spreads the meal into the cake former, where it is pressed under 500 lbs. into a formed cake suitable for the hydraulic press. A pad of hair is then put on each side of the cake and it is lifted by hand into place on the press. This may be likened to a set of shelves, one cake with its mats being placed on each shelf. The cakes are about 31 x 10 inches in size, and 1½ inches thick, and a press will take about twenty of these cakes. Five and a half bushels of seed are required to fill the press, and each press yields about six barrels of oil in a 24-hour day of continuous operation. Approximately twenty bushels of domestic seeds are required for each barrel of oil. The Argentine seed yields about 5% more oil per bushel than domestic seed, and the Bombay variety of Indian seed yields about 5% more than the Argentine.

After the press is filled, the hydraulic pressure is turned on, and a giant piston slowly pushes the shelves together from below. It continues until the whole press is under a pressure of 4,000 lbs. per square inch. The pressure is left on for an hour, while the oil flows down to the bottom of the press and back and forth through a series of troughs to settle out the suspended matter. From there it goes to a filter press, where it is filtered through cloth and comes out as a clear amber oil, which is again filtered through cloth and paper to remove all impurities. It may then go into storage tanks for shipment as raw linseed oil, or go on for further refining into special linseed oils.

The residual by-product "cake" is ground up for cattle feed. Domestic cake is crushed and used in this country, but the cake from imported seed is largely exported for the same purpose since there is a drawback allowance on the import duty, amounting to 65 cents per bushel. The price obtained for the cake is one of the important factors in determining the price for which the oil must sell, since these are the only two products obtained from the process, and the return from both sources is necessarily closely related.

Marketing the Oil

Formerly, most of the oil was used in the raw state, simply because it was not available in any other form. However, raw oil may contain as much as .2% moisture, and 2% of "Foots" and "break," which is the mucilage-like substance present in the seed as cell walls. It may have all of these and still be of fair average quality, passing the requirements of the A.S.T.M. and Federal specifications. The development of mod-



The cells yield their oil under 4,000 pounds of pressure in the hydraulic press.

DOMESTIC ACREAGE, YIELD AND PRODUCTION OF FLAXSEED

Source: Bureau of Agricultural Economics

	ACREAGE HARVESTED in Thousands of Acres				YIELD PER ACRE in Bushels				PRODUCTION in Thousands of Bushels			
	Average 1928-32	1936	1937	1938	Average 1923-32	1936	1937	1938	Average 1928-32	1936	1937	1938
Minnesota	706	719	453	453	9.3	4.9	9.0	10.5	6,040	3,523	4,077	4,756
North Dakota	1,225	225	292	298	6.1	2.7	5.3	5.0	5,944	608	1,548	1,490
South Dakota	458	53	53	45	6.1	2.5	4.3	8.5	2,170	132	228	382
Montana	284	13	14	42	5.6	4.0	3.1	5.0	1,149	52	43	210
Kansas	39	42	57	51	6.3	4.0	5.8	7.2	241	168	331	367
Iowa	19	10	8	10	9.8	8.0	11.5	12.0	178	80	92	120
Wisconsin	7	4	4	4	11.5	10.0	10.5	11.0	79	40	42	44
Others	34	60	53	51	...	...	...	...	195	670	728	802
Total, U. S.	2,772	1,126	934	954	6.9	4.7	7.6	8.6	15,996	5,273	7,089	8,171

ern refining methods now makes available at moderate premiums a full line of high quality special oils which have to a great extent replaced raw linseed oil in the paint, varnish and allied industries.

The most commonly accepted specifications are Federal Specification JJJ-0-336, and A.S.T.M. Specification D234-28:

Specific Gravity....0.930 to 0.936
Iodine Number.....177 min.
Saponification Number 189 to 195
Acid Number.....4.0 max.
Unsaponifiable Matter....1.5%
Loss on Heating.....0.2%
Foots, heated sample.....1%
Foots, chilled sample.....4%

High grade oil may have an iodine number of 185 or higher. Boiled oils will have higher specific gravity, lower iodine number, and darker color. Some states prescribe chemical and physical limits by law, a protection against adulteration with other less expensive seed oils, rosin oil, fish oils, etc., the presence of which is not apparent on visual inspection, particularly in the case of the darker boiled oils.

The New York Produce Exchange inaugurated a market for trading in linseed oil, but there was so little activity in this commodity that it was discontinued in October 1938. It can however be bought from the crushers for either spot or future delivery, the crusher being the one to set the spread and also how far forward he will sell. The oil is sold to industrial consumers by the pound, and quotations are on the raw oil basis, with premiums for the refined oils. Being a world commodity, the price frequently fluctuates from day to day. Direct sales are practically all in tankcar or carload quantities of six, eight or ten thousand gallons, smaller lots being handled by jobbers in drums and smaller containers. In territories where consuming industries are concentrated, and close to the linseed mill, delivery is often made in tank trucks carrying from 35 to 70 barrels of oil in bulk. There is practically no export trade.

About 65% of the domestic consumption is in the paint and varnish industries, and 20% in the manufacture of linoleum and other floor coverings. The remaining 15% goes to a variety of other uses, among the more important of these being printers' ink, oiled cloth and clothing, imitation and patent leather, foundry oils, and rubber substitutes.

Continuous Process for Viscose

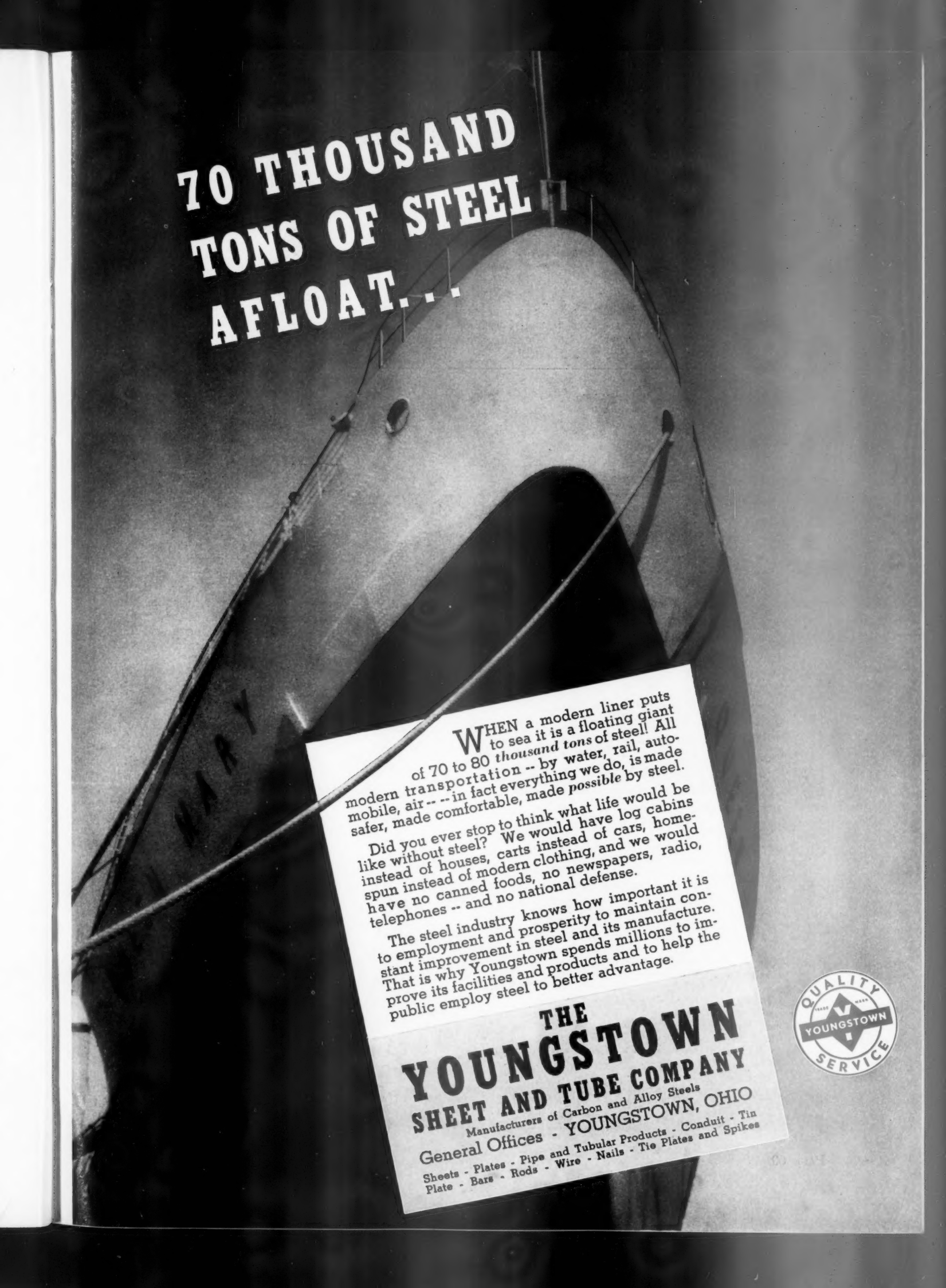
A NEW continuous process for the production of viscose yarn was described by M. P. Epstein of the Industrial Rayon Corp., at the recent annual meeting of the American Association of Textile Technologists.

Production starts, as in the standard process, with the sheet of pulp board, which is mercerized, shredded, aged, dissolved, and prepared for spinning in the usual way.

In ordinary practice, the honey-like viscose is pumped through a spinerette or nozzle containing many fine holes, in an acid bath which coagulates the viscose into a thread. It is then twisted in a revolving pot, reeled in 44-inch skeins, mounted on rods, washed and dried; desulphurized and washed again; bleached, scoured, lubricated in an oil shower, wrapped, centrifuged, dried, conditioned, and wound.

In the new process, this entire series of operations, normally requiring frequent rehandling and an elapsed time of from eighty to ninety hours, is accomplished in six minutes on a single machine nineteen feet in height. By means of a "self advancing reel," about 2,000 feet of yarn are actually in transit on each spinning end, under precision control and practically without strain.

The advantages of the process, besides the tremendous saving of time, are the elimination of injury, knots and breakage due to excessive handling, and greater uniformity since the yarn is not subjected to variations in winding and other treatments which influence the dyeing quality of the yarn.



WHEN a modern liner puts to sea it is a floating giant of 70 to 80 *thousand tons* of steel! All modern transportation -- by water, rail, automobile, air -- -- in fact everything we do, is made safer, made comfortable, made *possible* by steel.

Did you ever stop to think what life would be like without steel? We would have log cabins instead of houses, carts instead of cars, homespun instead of modern clothing, and we would have no canned foods, no newspapers, radio, telephones -- and no national defense.

The steel industry knows how important it is to employment and prosperity to maintain constant improvement in steel and its manufacture. That is why Youngstown spends millions to improve its facilities and products and to help the public employ steel to better advantage.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels

General Offices - YOUNGSTOWN, OHIO

Sheets - Plates - Pipe and Tubular Products - Conduit - Tin Plate - Bars - Rods - Wire - Nails - Tie Plates and Spikes

QUALITY YOUNGSTOWN SERVICE

Personalities in the News

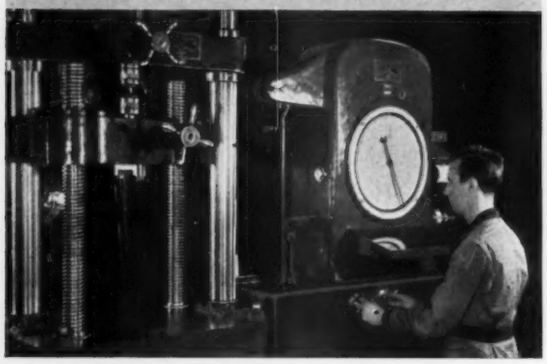
HARRY F. KOLB, for the past two years director of purchases for the Hercules Powder Co., at Wilmington, Del., has been transferred to the company's Universal By-Products Division at San Francisco, in the Casein Department. In his new assignment, Mr. Kolb returns to the scene of the greater part of his 35 years' service with the company and its affiliates. He was western purchasing agent for many years and assistant manager at San Francisco prior to his work at Wilmington. J. B. JOHNSON, formerly manager of the San Francisco distict, succeeds Mr. Kolb as director of purchases at Wilmington.

F. J. BUMBACH has been appointed purchasing agent of the Keystone Public Service Co., Oil City, Penna., succeeding the late B. L. Cole.

A SAFETY FACTOR TO *Resist "Sledge Hammer" Shocks*

—BUILT INTO EVERY PARKER-KALON COLD-FORGED SOCKET SCREW

PRECISE CONTROL OF DUCTILITY — To protect you against failure of socket screws under heavy shock loads, Parker-Kalon controls vital ductility to a "hair's breadth." On this modern Olsen Machine in Parker-Kalon's Laboratory, socket screws are literally *pulled* to pieces, then checked for elongation. You'll never see a brittle Parker-Kalon Cold-forged Socket Screw!



"16 POINT QUALITY-CONTROL" Leads Critical Buyers to Demand PARKER-KALON

A Ductility Test is only one of 16 check-ups on important characteristics of Parker-Kalon Cold-forged Socket Screws. In a laboratory without counterpart in the industry, quality is guarded by thorough tests and inspections covering:

1—Chemical Analysis. 2—Tensile Strength. 3—Ductility. 4—Torsional Strength. 5—Ability to take Shock Loads under Tension. 6—Resistance to Shock Loads under Shear. 7—Hardness. In addition, there is a rigid inspection of these essentials: 8—Head Diameter. 9—Head Height. 10—Concentricity of Head to Body. 11—Socket Shape. 12—Socket Size. 13—Socket Depth. 14—Centricality of Socket. 15—Class 3 Fit Threads. 16—Clean Starting Threads.

In this way Parker-Kalon maintains a new higher standard of quality . . . a standard that satisfies critical buyers. Send for free samples . . . see for yourself.

PARKER-KALON CORP., 206 Varick St., New York.

PARKER-KALON Cold-Forged SOCKET SCREWS

L. W. JONES

LESTER W. JONES, Purchasing Agent for McCormick & Co., Inc., Baltimore, has been elected to the Board of Directors of that organization. Mr. Jones, who came with the company seven years ago to establish a centralized purchasing department, has served four terms as chairman of the Junior Executive Board, is a member of the merchandising committee, and a director of the McCormick Sales Co. and the McCormick Warehouse Co.

G. B. EDMONDSON formerly city auditor at Fargo, N. D., has been appointed State Purchasing Agent by the Board of Administration.

HAROLD KEENAN, for the past several years associated with the Sedgwick County (Kansas) Highway Department at Wichita, has been named County Purchasing Agent to succeed the late William Graham.

H. W. CHRISTENSEN has been appointed General Purchasing Agent of the Columbia Steel Co., subsidiary of U. S. Steel Corp., with headquarters at San Francisco. He succeeds L. S. JONES, retired. Mr. Christensen became purchasing agent for the Llewellyn Iron Works, Los Angeles, in 1920, and was named general purchasing agent of its successor company, Consolidated Steel Corp., in 1928, resigning in 1933 to joint the Columbia Steel Co., as manager of the rolled steel products department. He has been an active member of the Los Angeles association, serving as president at the time of

Reducing to a NEW LOW

The Cost of Grinding Cemented Carbide Tools . .

NORTON METAL BONDED DIAMOND WHEELS

HERE'S a diamond wheel that can really "take it"—a wheel so durable that it will outlast several resinoid bonded diamond wheels on the off-hand grinding of single point cemented carbide tools—a wheel so strong that it resists grooving and rounding of the corners.

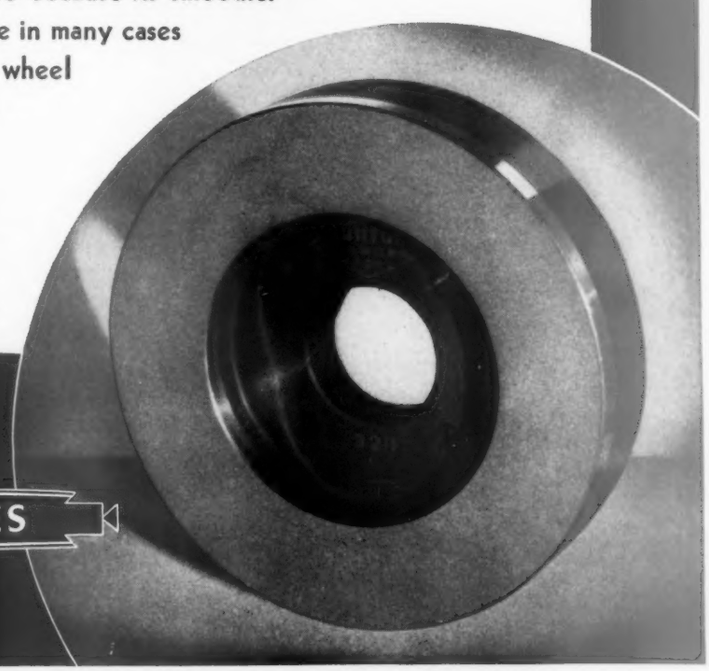
In this new Norton Metal Bonded Wheel the diamonds are actually imbedded in solid metal—a special alloy that holds the tiny diamond particles securely to resist the severe usage for which this wheel is specifically recommended.

Not only is this Norton Wheel cutting costs because of its long life and resistance to damage but also because its smoother grinding action makes it possible in many cases to recondition tools with one wheel instead of two separate wheels for roughing and finishing.

Full information upon request

NORTON COMPANY
Worcester, Mass.

W-727



NORTON ABRASIVES

the N.A.P.A. convention in that city in 1926. The following year he was Vice President for District No. 1, N.A.P.A. He has a distinguished record of service in the World War as a captain in the Field Artillery, was for several years Commander of the mounted squad of the Los Angeles Police Department, and was a judge at the equestrian events in the 1932 Olympic games.

DR. RUSSELL FORBES, Commissioner of Purchase for the City of New York, addressed the annual banquet session of the League of Virginia Municipalities at Old Point Comfort, September 18th, urging the adoption of a plan of centralized purchasing for all cities.

GEORGE L. BARTA, Purchasing Agent of the American Sugar Refining Co., retired from active business October 1st after fifty years of service in the company's Brooklyn office.

HARRY WEIR has been appointed purchasing agent of the National City Bank, New York, succeeding FREDERICK SCHNEIDER, retired. Mr. Weir has been assistant purchasing agent since 1922.

E. J. PARENT, Purchasing Agent of the Mathieson Alkali Works at Niagara Falls, has been appointed General Purchasing Agent of the company with offices in New York City, where the major part of the buying for the Niagara Falls, Lake Charles (La.) and Saltville (Va.) plants will be centralized. Mr. Parent is a past president of the Buffalo Association.

J. C. POTTS, Purchasing Agent of the Treadwell Construction Co., Midland, Penna., has been elected secretary-treasurer of that company. E. M. NEASE succeeds Mr. Potts as purchasing agent.

Obituary

A. H. ELLISON, Purchasing Agent of the Pittsburgh Coke & Iron Co., died August 9th.

JOHN WILLIAMS, Purchasing Agent of the Pacific Great Eastern Railway, died in St. Paul's Hospital, Vancouver, on August 17th, following an operation. Mr. Williams was an active member and past president of the British Columbia Association.

CHARLES W. STIERS, 52, for the past 18 years purchasing agent of the Chrysler Corp., at its New Castle, Ind., plant, died in that city September 8th after a protracted illness.

JOHN HENRY RENKEN, 50, formerly City Purchasing Agent at Charleston, S. C., died suddenly at his home, September 9th.

COL. CHARLES ARCHER OSBORNE, 70, who was appointed as the first Director of the Department of Purchase and Printing, State of Virginia, when that office was created in 1918, and served in that capacity under five governors, died at Richmond, September 17th, of a heart attack.

FREDERICK J. BROWN, for many years purchasing agent for the Smith Worthington Co., Hartford, Conn., died at his home in that city, September 17th.

CHARLES W. McINTOSH, 64, New England Purchasing Agent for Swift and Co., died at his home in Lexington, Mass., October 1st.

.... *Two New*
Centrifugal Motorpumps
Compact — Modern — Flexible in Installation —
for Supplying Coolant
or for light transfer work

Can be mounted either horizontally or vertically.

Motors are fully enclosed with permanently sealed ball bearings for dependability and long service.

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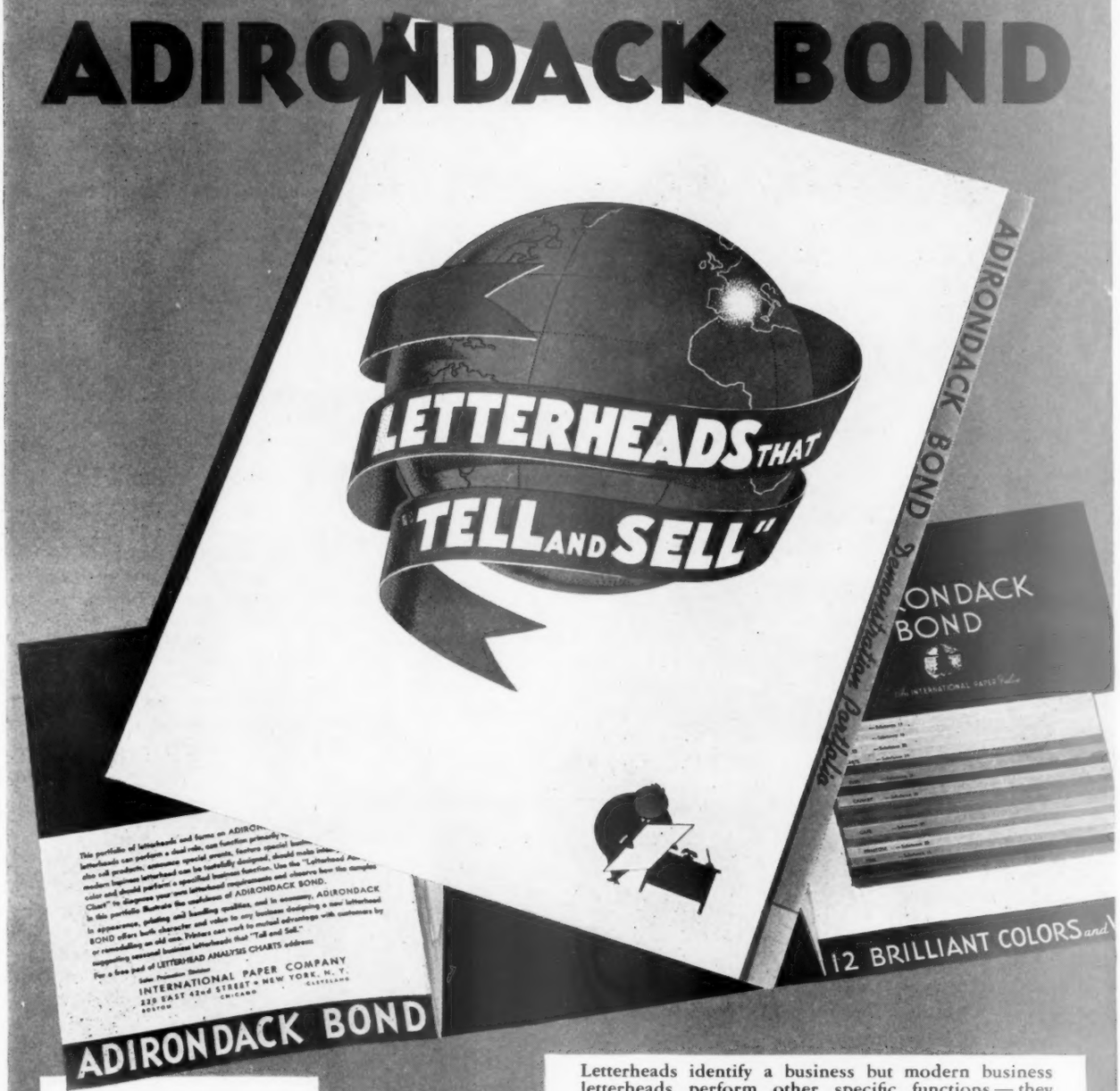

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Among the Associations

SEPTEMBER 1

PORTLAND — Luncheon meeting of the OREGON ASSOCIATION, at the Mallory Hotel. Speaker: Marshall Dana, "Recent European Developments As They Affect the United States."

SEPTEMBER 5

OAKLAND—Luncheon meeting of the EAST BAY GROUP, NORTHERN CALIFORNIA ASSOCIATION, at the Lake Merritt Hotel: Speaker: Paul Trotter, "Selling Yourself in Business."

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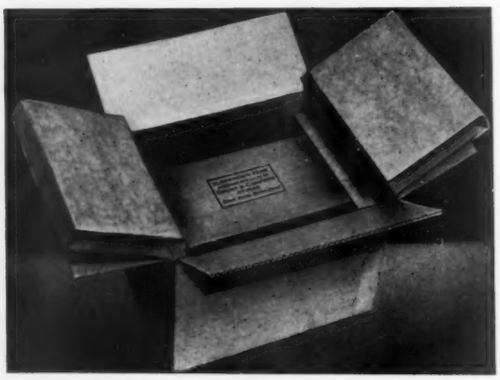
Air Cushion on all sides of inner box protects contents from shocks absorbed by Outer Box.



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CORRUGATED PAPER PRODUCTS

6935 W. 65th STREET CHICAGO, ILLINOIS

SEPTEMBER 7

SAN FRANCISCO—Luncheon meeting of the NORTHERN CALIFORNIA ASSOCIATION, at the Palace Hotel. Speaker: Roland W. Peterson, Purchasing Agent of the Glidden Co., "Right Buying—Time, Place, Price."

RENO, PENNA. — Dinner meeting of the NORTHWESTERN PENNSYLVANIA ASSOCIATION, at Wanango Country Club. Round table discussion of departmental procedure and the commodity outlook.

SEPTEMBER 9

KALAMAZOO — Dinner meeting of the KALAMAZOO VALLEY ASSOCIATION, at the Columbia Hotel. Round table discussion of commodity markets and price trends.

SEPTEMBER 11

WYOMISSING, PENNA. — Dinner meeting of the READING ASSOCIATION, at the Iris Club, with the new officers in charge. Round table discussion of commodity price situation.

HOUSTON—First fall meeting of the HOUSTON ASSOCIATION, at the Rice Hotel. Three new members were added. Round table discussion of commodity price trends.

SEPTEMBER 12

NEW YORK—Dinner meeting of the METROPOLITAN PURCHASING ASSISTANTS CLUB, of the Great Northern Hotel. Speaker Benedict Van Voorhis, Division Purchasing Agent of E. I. duPont de Nemours Co., "Industrial Purchasing."

CINCINNATI — Golf outing, dinner meeting of the CINCINNATI ASSOCIATION, at the Clovernook Country Club. Speaker: Dick Bray, sports announcer for Station WSAI, "Sidelights on Broadcasting Sports Events." Preliminary plans and organization for the 1940 N.A.P.A. convention, to be held in Cincinnati, were discussed.

TULSA—Dinner meeting of the TULSA ASSOCIATION. Round table discussion on the question, "What effect will war have on prices?"

NEXT TIME YOU WANT TOOLS *in a* *hurry..* THINK OF THIS MAP

You are within a few minutes, at most a few hours of an adequate stock of G. T. D. Greenfield tools. Back of distributors' stocks are six factory or warehouse stocks, and for "rush" specials there are two fully-equipped plants at strategic centers.

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"GREENFIELD" TAPS DIES · DRILLS SCREW PLATES PIPE TOOLS REAMERS GAGES SOLD BY DISTRIBUTORS EVERYWHERE

"LIGHT-CONDITIONING AIDS PRODUCTION... RAISES MORALE"

Says the Factory Manager of **THE DOBECKMUN COMPANY,** **"CELLOPHANE"** *converters, Cleveland*

Good light from 300 watt G-E MAZDA *lamps in RLM reflectors on 12' centers supplements daylight in the Dobeckmun plant, makes work go faster and easier.*

"LIGHT-CONDITIONING in our factory is more than an aid to production," according to the factory manager of the Dobeckmun Company. "It makes the plant cheerier, it raises morale, it contributes to the well-being of our employees by helping prevent eyestrain. "By making surroundings more pleasant, it has a psychological effect—it contributes to happiness. We believe in providing good light." Good light is a necessity in every industrial plant. It helps everyone see more easily, work with less fatigue, and do a more efficient job. As in many other leading manufacturing plants, the Dobeckmun Company uses the new G-E MAZDA lamps. Because these lamps stay brighter longer, they give more light for the current consumed.

For a free copy of a valuable booklet, "Lighting for Production in the Factory," write General Electric Company, Dept. 166-P-J, Nela Park, Cleveland, Ohio.

G-E MAZDA LAMPS

GENERAL ELECTRIC

SEPTEMBER 13

MINNEAPOLIS—Plant visit of the TWIN CITY ASSOCIATION, at the B. F. Nelson Mfg. Co., followed by a dinner meeting at the Radisson Hotel. Speaker: Walter H. Hallstein of Chicago, District Vice President, N.A.P.A. Forum on purchasing policies under present market conditions.

COLUMBUS — Buffet luncheon and outing of the COLUMBUS ASSOCIATION, at the summer home of Richard H. Evans, on Big Walnut Creek. There was a program of outdoor sports during the afternoon.

BUFFALO—Dinner meeting of the BUFFALO ASSOCIATION, at the Lafayette Hotel. Speakers: Abel C. Kay, Purchasing Agent of Firestone Tire & Rubber Co. of Canada, and Martin A. Brumbaugh, Professor of Statistics, University of Buffalo, "The Commodity Outlook," There was a spirited forum discussion of the present price advance.

SEPTEMBER 14

LOS ANGELES — Dinner meeting of the LOS ANGELES ASSOCIATION, at the Elks Club. Symposium: What Effect Will the War Have on Commodity Prices? Steel, textiles, chemicals, rubber, non-ferrous metals, paper and pulp, petroleum products, paints and oils, agricultural products.

SPRINGFIELD — Fall outing and golf tournament of the WESTERN MASSACHUSETTS ASSOCIATION, at the Springfield Country Club. A dinner meeting was held at the clubhouse. Frank E. Phillips, National Director, reported on the San Franscisco convention, and Major J. A. Bonneau of the 26th Division Ordnance Corps also addressed the meeting on "Our Army, Its Organization, Its Operation and Its Mission." R. A. Carpentier of Storms Drop Forging Co. was general chairman of the outing, and W. M. Case of Perkins Machine & Gear Co. presided at the dinner.

SEATTLE—Dinner meeting of the WASHINGTON ASSOCIATION, at the Olympia Hotel. Motion pictures of the annual picnic at Beaver Lake were shown. Joseph C. Blucher led a discussion on "Current

Do You Buy Hacksaws? Then Read the Story BEHIND THIS PICTURE!

TEETH THAT BITE

ATKINS *Silver Steel* **SAWS**

CERTIFIED SAWS, SAW TOOLS, MACHINE KNIVES, ETC.

The story is brief, but of great significance to the P.A. who periodically faces the problem of selecting hack saw blades. The picture shows one of the dozens of practical tests which preceded announcement of the New Atkins Super-Power Blades No. 400-500 to the metal cutting world. Cutting 3" round chrome nickel molybdenum steel bars, as shown, these blades far surpassed all previous test records — and ended these grueling tests with plenty of cutting life left.

Based on these and other tests, the new blades are unqualifiedly offered to cut 25% more metal on the same job alongside other saws. What's more, their scientific tooth design permits faster and straighter cutting than ever before. Have your shop run its own tests on Atkins Super-Power Blades — the results will soon demonstrate their unparalleled ability to lower the "cost per cut."

Atkins Super-Power Blades are available in two tooth spacings: No. 400 for rounds up to 5" or equivalent square stock; No. 500 for rounds over 5" or equivalent.

E. C. ATKINS AND COMPANY, 446 S. Illinois St., Indianapolis, Ind.

Whether it's a Wiper or a Wrench—

You wouldn't expect a watch repairer to work with a pipe-wrench. Nor would an optometrist's pliers be well adapted for work on a locomotive. Each job requires a tool fitted to the need.

For the same reason a good wiping material must be *versatile*. And that's one important reason why the man who works on the job prefers *rags*—material that can, if necessary, be *torn* to provide a wiper the proper size for the task at hand. Of course he wants them *sterilized*—safe to use.

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PITTSBURGH, PA.
Armstrong Sanitary Wipers Co., 1233 Spring Garden Ave., N.S.
Scheinman-Neaman Co., 1024 Vickroy St.

CLEVELAND, O.
Manseo Corp., 3524 East 74th St.

ST. LOUIS, MO.
Wiping Materials Inc., 2000 N. Main St.

For prices and samples write any above member. For Institute specifications write any member or The Sanitary Institute of America, 105 West Monroe St., Chicago, Illinois.

Commodity Prices and Future Outlook." Victor E. Rabel of the Star Machinery Co. spoke on "Observations While Traveling Through Europe," illustrating his talk with motion pictures.

SAN FRANCISCO—Luncheon meeting of the NORTHERN CALIFORNIA ASSOCIATION, at the Palace Hotel. Colored motion picture, "Guatemala," presented by John H. Rogers, Pan-American Airways System.

DALLAS — Meeting of the DALLAS ASSOCIATION, at the Adolphus Hotel. Forum on the war's effect on commodity markets.

SEPTEMBER 15

ENDICOTT, N. Y. — Plant visit of the ROCHESTER ASSOCIATION, at the International Business Machines Corp.

SEPTEMBER 19

PITTSBURGH — Dinner meeting of the PITTSBURGH ASSOCIATION, at the William Penn Hotel. Speaker: Dr. Kingsley R. Smith, Assistant Professor of Psychology at The Pennsylvania State College, "Business Psychology and the Purchasing Agent."

NEW YORK—Dinner meeting of the NEW YORK ASSOCIATION, at the Builders Exchange Club. Speaker: Donald G. Clark, Purchasing Agent of the Gulf Oil Corp., Pittsburgh, "Prerogatives of the Purchasing Agent." The meeting was preceded by an afternoon forum meeting on the topic, "War and Its Effect on Commodities and Prices," led by John D. Leeson.

ST. LOUIS—Dinner meeting of the ST. LOUIS ASSOCIATION, at the Hotel York. Speaker: Dr. Joseph H. Taggart, Professor of Economics and Finance, University of Kansas, "War Economics in 1939."

LOUISVILLE—Annual "Executive Night" dinner of the LOUISVILLE ASSOCIATION at the Kentucky Hotel. Speaker: Clarence E. Manion, Professor of Constitutional Law at Notre Dame University and Indiana Director of the Federal Office of Government Reports, "Looking Forward to 1940."

SEPTEMBER 20

ROCHESTER — Luncheon meeting of ROCHESTER ASSOCIATION members at the Chamber of Commerce, to draft a policy protecting the city from the unfortunate effects of possible sudden price rises, speculation and profiteering.

SEPTEMBER 21

OAKLAND — Joint dinner meeting of the NORTHERN CALIFORNIA ASSOCIATION and the East Bay Manufacturers' Committee of the Oakland Chamber of Commerce, at the Hotel Leamington.

CLEVELAND—Dinner meeting of the CLEVELAND ASSOCIATION, at the Hotel Cleveland. Speaker: Russell Weisman, Professor of Political Science, Western Reserve University, "The Effect of War upon the Economic Situation," J. R. Keach of the Ohio Rubber Co. spoke on the advantages of blanket orders for standard and staple items.

NEW SALEM — Clambake and outing of the EASTERN NEW YORK ASSOCIATION, at Picards.

OUR GUARANTEE

Every article bought from this catalog is guaranteed to be exactly as illustrated and described, and to give satisfaction. Any article that is not satisfactory may be returned for credit or cash refund within ten days from date of purchase.

and OUR POLICY

It has been our policy for more than 27 years to supply quality merchandise at lowest possible prices and to render unexcelled service. The steady growth of this business is due to our adherence to this policy.

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SEPTEMBER 22-23-24

HAMILTON, ONT. — Fifteenth convention and industrial products exhibit sponsored by the COUNCIL OF CANADIAN PURCHASING AGENTS' ASSOCIATIONS, at the Royal Connaught Hotel.

Friday Morning Session

Chairman, A. C. Kay, Purchasing Agent of Firestone Tire & Rubber Company of Canada, Ltd., and President of the Hamilton Association.

Invocation, Right Reverend L. W. B. Broughall, M.A., D.D., Anglican Bishop of Niagara.

Address of Welcome, His Worship, Mayor William Morrison, K.C., Corporation of the City of Hamilton.

Address, "The International Economic Outlook," K. W. Taylor, M.A., Professor of Political Economy, McMaster University.

Address, "Budgetary Control as an Aid to Business Profit," G. C. McEwen, Vice President and General Manager, Imperial Varnish & Color Co., Ltd., Toronto.

Friday Luncheon

Chairman, B. H. Yardley, Purchasing Agent of Stanley Works of Canada, Ltd., and Past Vice President, District No. 5, N. A. P. A.

Address, "What Can You Do with a Guy Like That?" Don Henshaw of A. McKim, Ltd., Toronto.

Friday Afternoon Session

Chairman, L. Tolson, Purchasing Agent of MacLean Publishing Co., Ltd., and President of the Toronto Association.

Address, "Current Trends in Canadian Industry and Trade," F. J. Hornung, Economist, Royal Bank of Canada, Montreal.

Address, "The Work of the Research Foundation," Dr. H. B. Speakman, Director of Ontario Research Foundation, Toronto.

Address. "Commodities in Our Canadian Economy," W. A. McKague, Associate Economist, Canadian Council of Purchasing Agents.

Discussion, led by Julian G. Davies of N. Slater Co., Ltd., Hamilton.

Friday Dinner Meeting and Salesmen's Night

Chairman, A. C. Kay.

Address, "10,000 Miles in a Bomber," Captain H. Cotton,

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The new Frasse Stock List, like its predecessors, is designed to save your time.
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R.F.C., Fort Erie North, Ontario.
Reunion of the "Canadian Council Old Boys."

Saturday Morning Session

Chairman, W. O. Graburn, Purchasing Agent of Ottawa Car Mfg. Co., Ltd., Ottawa, and President of the Montreal Association.

Address, "From One P. A. to Another," George A. Renard, Executive Secretary, N.A.P.A.

Address, "The N.A.P.A.," Thomas D. Jolly, Purchasing Agent of the Aluminum Co. of America, Pittsburgh, and President of the N.A.P.A.

Address, "The Amber Light," by B. H. Yardley.

Remarks, Sydney E. Webster, Purchasing Agent of the Dominion Textile Co., Ltd., Montreal, Chairman of the Canadian Council and Vice President for District No. 5, N.A.P.A.

Remarks, C. C. Callowhill, purchasing Agent of the American Can Co., Hamilton, and General Chairman of the Convention.

Saturday Luncheon

Chairman, S. E. Webster.

Address, "The Trend of World Affairs," Capt. R. G. Cavell, Vice President and General Manager, Canadian Telephones & Supplies, Ltd., Toronto.

Saturday Evening Annual Banquet

Chairman, C. C. Callowhill.

Address, His Worship, Mayor William Morrison, K.C.

Entertainment and dancing

Ladies Entertainment

Friday.

Visit to National Paper Goods Co., Ltd.
"Royal Four" of the Niagara Peninsula.
Luncheon at The Refectory, Victoria Park.
Afternoon Tea at Welland House, St. Catherines.
Dinner and Bridge at Hamilton Golf & Country Club, Ancaster.

Saturday.

Shopping tour.
Luncheon at the Royal Connaught.
Sight-seeing trip: Hamilton, McMaster Univertisy, Albion Falls, Stoney Creek Battlefields.
Afternoon Tea at Glendale Golf & Country Club.
Banquet and dance.

Sunday, Sept. 24

Golf tournament at the Glendale Golf & Country Club, 18 holes medal play for the Association Cup.

SEPTEMBER 22

PORTLAND — Luncheon meeting of the OREGON ASSOCIATION, at the Mallory Hotel. Speaker: Roderic Olzendam, Director of Public Relations for the Weyerhaeuser Timber Co., "The Perpetuation of Our Timber Land."

INDIANAPOLIS — Golf outing and dinner meeting of the INDIANAPOLIS ASSOCIATION, at the Indianapolis Country Club. C. A. Boss of Centreville, Mich., N.A.P.A. Vice President for District No. 4, was present at the meeting. Speaker: Dean M. A. Ross, Professor of Economics, Butler University, "Governmental Controlled Economics."

SEPTEMBER 25

PROVIDENCE — Dinner meeting of the RHODE ISLAND ASSOCIATION, at the Narragansett Hotel. Speaker:

To Our Customers:

DO NOT BE ALARMED by rumors now current regarding shortage of supplies of Adhesives, Gums, Starches, Dextrines, and other allied products.

This Company announces that it has adequate stocks to insure all its customers of a normal supply of standard materials, and expects to fulfill all its contracts and advance bookings in its usual manner (unforeseen or unusual contingencies excepted).

Recognizing that the steady supply of our products represents a service that is vital to your continuous operation, our first interest is the proper protection of that service — YOUR GOOD WILL — our most valuable asset.

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Incredible? Not when you ship them by super-speed AIR EXPRESS—2500 miles overnight! Spare parts, replacements, accessories, light machinery—most anything you want to send or receive—zip 3 miles a minute direct to 232 key cities at low cost, high profits. Nation-wide service with fast air-rail service to off-airline points. Also to Canada, Latin America, Hawaii and Far East. For action phone RAILWAY EXPRESS, AIR EXPRESS Division.

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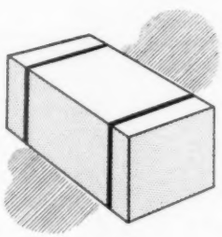


Stanley Strapping tensions container with strong steel bands, permits lightening your container with safety. Stanley Colorgraph Strapping dresses up your cartons . . . carries your name, trade mark or sales message in brilliant colors. Identifies your product instantly.

TIME SAVINGS

New Stanley "Ace" Strapping Tool applies strapping in a few seconds. Light . . . weighs only 10 lb., 3 oz. It tightens strapping, feeds its own seals, crimps seals and cuts strapping with two easy, natural motions of the arms. Precision-built to close tolerances throughout. Unlimited take-up. Spring-fed, so it will operate perfectly in any position.

HANDLING SAVINGS

made easy with "Ace" and new Stanley "Ace" Accessories. They position the tool, container and strapping on roller conveyor or shipping bench for "production" jobs as fast as they come. Regular Stanley Accessories, or a combination, will handle most strapping jobs, or Stanley Engineers will design new ones to fit your needs.

STANLEY
TRADE MARK

Write for Folder "TWICE AS FAST"

IT'S FREE

New Stanley Folder, "Twice As Fast", describes the new "Ace" Strapping Tool and Accessories, tells how the right combination can be put to work by Stanley Engineers for savings in your shipping room. The Stanley Works, Steel Strapping Division, New Britain, Connecticut.

STANLEY STRAPPING SYSTEM

We've learned a lot about YOUR business in fifty years

For instance, we've learned that one carbon paper will work well in one machine but not in another—that the weight and finish of copy paper influences the choice of carbon paper —that the operator's "touch" should be considered in selecting the proper typewriter ribbon.

These, and many other factors are important since the finest carbon paper or ribbon will give unsatisfactory results if it is not suited to the work. With the kind of help we give you, the customer frequently gets double the service he expected.

We don't just sell carbon paper and typewriter ribbons... we study your requirements, help you choose the materials best suited for the work to be done.

This valuable assistance plus the wide variety of carbon paper and typewriter ribbons available is one important reason why Webster is serving faithfully many of the country's leading business offices. Why not bring your typing problems to Webster. A careful check-up may not only simplify and improve the appearance of your office work, but actually give you more for your carbon paper and typewriting dollars.

Your nearby Webster Service Representative will be glad to survey your office, *without obligation.* Write to us—we will have him call.

MultiKopy carbon paper — Star Brand ribbons... two products of the Webster line... Sold by leading stationers the world over.

WEBSTER

CARBON PAPERS and TYPEWRITER RIBBONS

7 Amherst Street, Cambridge, Mass

Herbert N. McGill, President of McGill Commodity Service, "Changing Economic Trends:" The meeting was preceded by a round table discussion of war commodities and prices.

ALLENTOWN—Golf outing and dinner meeting of the LEHIGH VALLEY ASSOCIATION, at the Lehigh Country Club. Clyde T. Bischoff, character analyst and handwriting expert, entertained, and H. E. Edmonds, designing engineer of the Crocker-Wheeler Electric Mfg. Co. spoke on business experiences.

SEPTEMBER 26

OAKLAND—Luncheon meeting of the EAST BAY GROUP, NORTHERN CALIFORNIA ASSOCIATION, at the Lake Merritt Hotel. Speaker, Alpheus Bull, "Safety in Industry."

NEWINGTON, CONN. — "National Night" dinner meeting of the CONNECTICUT ASSOCIATION, at the Indian Hill Country Club. Speaker: George A. Renard, Executive Secretary of the N.A.P.A., "From One P. A. to Another."

TULSA — Open meeting of the TULSA ASSOCIATION. Speaker: Karl A. Young of Dallas, Secretary of the Production Division, American Petroleum Institute, "Trends and Developments in A.P.I. Standards."

SEPTEMBER 27-28-29

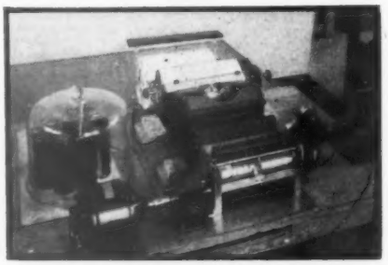
SYRACUSE — Fifth annual Industrial Products Exhibit sponsored by the SYRACUSE & CENTRAL NEW YORK ASSOCIATION, at the Onondaga Hotel. Preview dinner on Wednesday evening, C. H. Kissel of Goulds Pumps, presiding. Guest speaker: Frank Lovejoy, Sales Manager of Socony Vacuum Oil Co. Approximately 70 diversified exhibits presented a comprehensive and attractive display of "The Tools of Tomorrow."

The committee in charge was as follows: *General Chairman,* M. E. Jennings of Selflock Screw Products; *Vice Chairman,* C. J. Kuckhoff of Syracuse Stamping Co.; *Program,* L. A. Saunders of New Process Gear Corp., G. L. McCaffrey of Owen-Dyneto Corp., F. S. Thompson of Lowman Folding Box Corp.,

WHEN IS "*Quality*" EQUAL?

How E. T. L. can help the Purchasing Agent

One way by which a purchasing agent can determine equal quality is to secure information on whether or not the articles which are offered as "equal" meet the same specifications. That is where E. T. L. may be able to serve you. For example.



Typewriter Ribbons. Here is a picture of a test set-up, by which E. T. L. measured the durability of typewriter ribbons. Such a check on the quality of other articles you purchase in quantity might be helpful... items such as

Paper. E. T. L. has a paper-testing laboratory which will give you impartial facts as to quality to guide you in buying.

E. T. L. also has the facilities to check quality, in terms of given specifications, on many other products such as soap, oil, paint . . . so that you may know "equal" quality *by test.*

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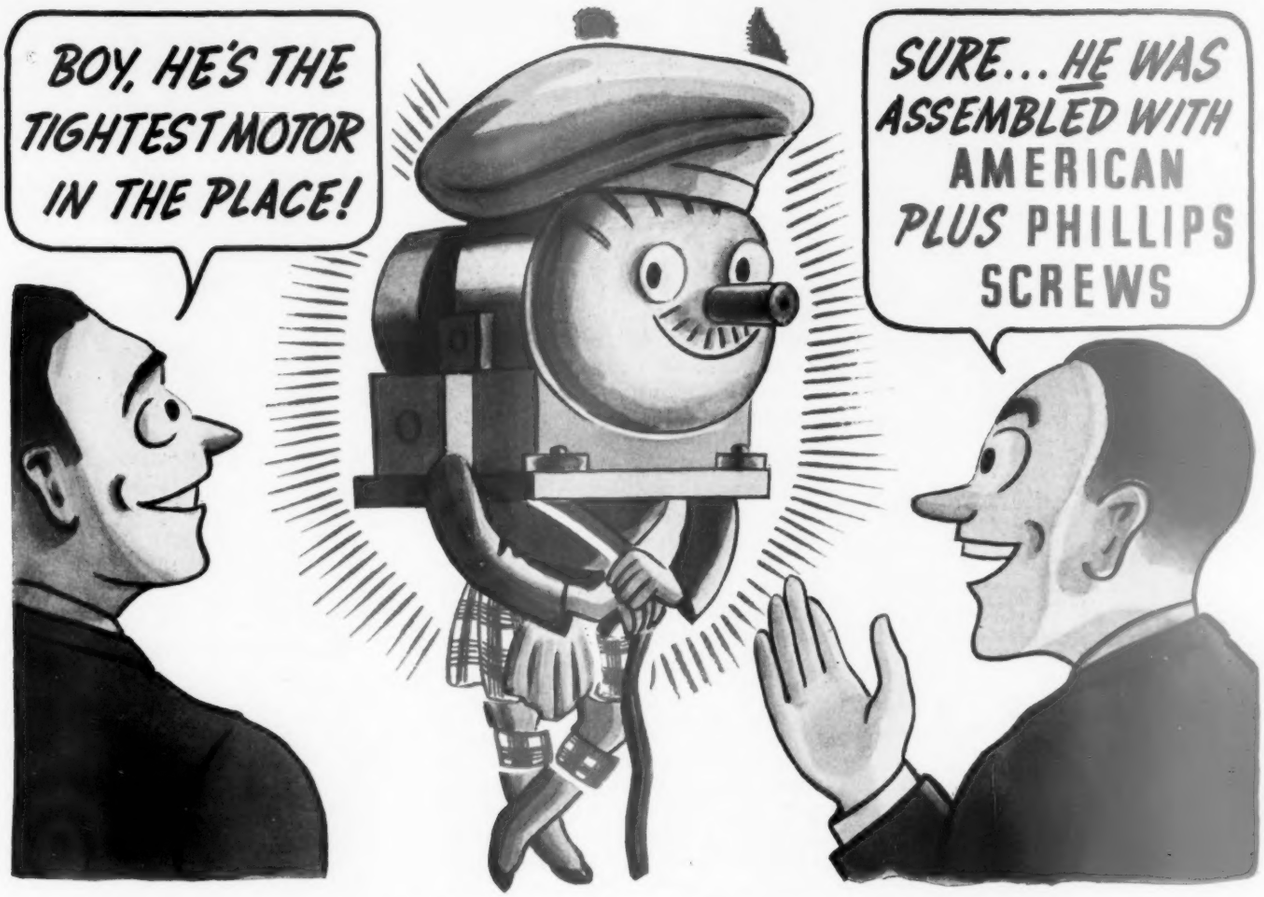

. . . and products assembled with American PLUS Phillips Screws *stay* tight. Phillips heads are strong, so the screws can be "driven home" without fear of splitting — providing more solid assembly. That's why so many aircraft manufacturers, for example, have switched to American PLUS Phillips Screws.

There's *another* "Scotch" aspect, too, to American PLUS Phillips Screws, for the manufacturer saves money on

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refinishing cost — No burred or crooked screws to replace, no scarred surfaces to refinish.

No Wonder Cost Minded Executives in American Industry are Saying:

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Why don't you find out, today, what *your* firm could save? Use the coupon below, for free information or a sample box of drivers and screws.

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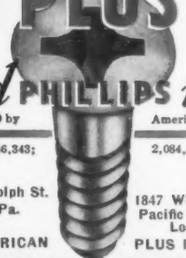

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U. S. Patents on Product and Methods Nos. 2,046,343; 2,046,837, 2,046,839; 2,046,840; 2,082,085; 2,084,078; 2,084,079; 2,090,338. Other domestic and Foreign Patents Allowed and Pending.

Chicago Office and warehouse: 219 W. Randolph St. Reading Screw Company, Norristown, Pa. (division of American Screw Co.)

Detroit Office and warehouse: 1847 West Bethune Street Detroit, Michigan
Pacific Coast Representative: Osgood & Howell, Los Angeles, Seattle, San Francisco

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AMERICAN SCREW COMPANY · PROVIDENCE, RHODE ISLAND

AMERICAN SCREW COMPANY,
Providence, Rhode Island

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☐ Please send sample kit of American PLUS Screws and driver. $1.00 to cover cost of packaging and postage is enclosed.

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Company.....

Address.....

Distributor.....

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SEPTEMBER 27

VANCOUVER—Plant visit of the BRITISH COLUMBIA ASSOCIATION, at the Vivian Engine Works.

SEPTEMBER 28

SAN FRANCISCO—Luncheon meeting of the NORTHERN CALIFORNIA ASSOCIATION, at the Palace Hotel. Speaker: Eugene Clark of National Broadcasting Co., "English As She Is Spoke." Mr. Clark also gave a memory demonstration.

SEATTLE — Plant visit and luncheon of the WASHINGTON ASSOCIATION, at Glaser Beverages, Inc., new bottling works.

TOLEDO — Dinner meeting of the TOLEDO ASSOCIATION, at the Waldorf Hotel. Motion pictures showing methods of manufacturing Swedish tool steel, shown by courtesy of B. E. Reminger, manager of the Peninsular Steel Co.

SEPTEMBER 30

BETHLEHEM — Meeting of the EIGHTH DISTRICT COUNCIL, N.A.P.A. Robert Porter of Philadelphia, District Vice President, presided.

OCTOBER 1

SAN FRANCISCO—Annual family picnic of the NORTHERN CALIFORNIA ASSOCIATION, at Linda Vista Picnic Paradise, Mission San Jose. Harry Levitt was chairman of the committee in charge.

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SCREWS · BOLTS
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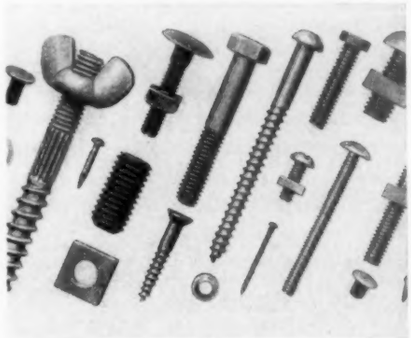

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Exports Are Down

The current rate of exports is estimated as about 5% below that of the corresponding period last year, and fails to show the customary seasonal rise for this period.

A number of factors are contributing to this situation: (1) an unusual spurt in August shipments, including heavy trade in aircraft and other finished goods bought in anticipation of the war; (2) the embargo on a variety of goods following the outbreak of hostilities; (3) the temporary loss of markets in the belligerent countries; and (4) the disruption of shipping schedules and the sharp advance in cargo insurance rates.

A protracted period of war would probably stimulate demand from these markets that are currently most adversely affected in international trade, but it is generally felt that no great stimulus will be felt from this source until late November or December, regardless of changes in our neutrality laws.

On the other hand, a moderate increase in imports may be expected to develop more promptly, as heavy withdrawals from warehouse stocks are depleting the available supplies of materials of foreign origin very rapidly, and there is a widespread policy of building up inventories on such goods. New sources are being actively sought among non-belligerent nations.

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Belt Hooks
have the patented blue Aligning Card that holds hooks in position, prevents them from loosening, prevents hook loss from handling, prevents waste of short ends. Every WIREGRIP Hook to the last one can be used.

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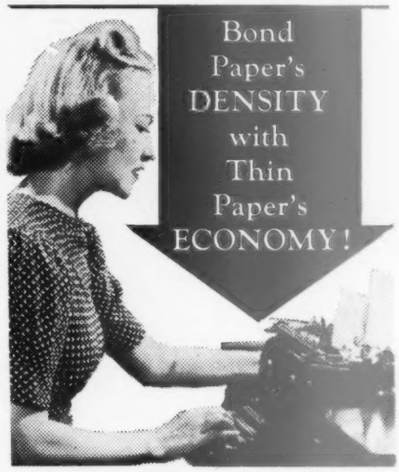
YOU CAN'T SEE THROUGH!



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THOUGH you make no keys, you may have a parallel problem. So, these facts (A) that key stock must have top-quality millability, and (B) that a very important percentage of the flat keys produced are made of Seymour free cutting Nickel Silver, should interest you. For, what the manufacturers of the country have found out about this alloy should be valuable to you in *any* non-ferrous milling job in your shops.

When next you are called into a conference, remember the name . . . SEYMOUR!

THE SEYMOUR MANUFACTURING CO.
55 Franklin St., Seymour, Conn.

SEYMOUR
NICKEL SILVER

When You Buy Automotive Equipment

(Continued from page 49)

more than half the states require the use of the rear-view mirror and the directional signal as well.

In general these devices are required only on vehicles so constructed or loaded, in the case of mirrors, as to obstruct the drivers' view to the rear; or in the case of directional signals, as to prevent others from seeing the driver's hand and arm signal, to the front and rear. A directional signal may be required, or in some cases a stop light, when the body or load projects more than a specified distance to the left of the steering-wheel center. In Massachusetts the distance is 22 in.; while the California law prescribes 32 in. Other states have established dimensions between these two extremes.

It has not been possible in this article to present all the details of construction or performance for the various kinds of equipment mentioned. Nor has all equipment that may be required been discussed. Horns and mufflers, in good working order, are mandatory equipment in most states, and a few require that governors, bumpers, fenders must be installed on particular classes of motor vehicles. Such details are ordinarily incorporated as standard equipment in most truck models, and satisfy the requirements of practically all the states.

Prize Paper on Purchasing

The annual award of the Governmental Research Association for the most noteworthy piece of research during the year by a member, went to Paul Wilcox, Executive Director of New Haven Taxpayers, Inc., for a paper entitled, "An Analysis of New Haven's Purchasing and Its Possible Centralization." The award was made at the twenty-eighth annual conference of the Association, held at Princeton, N. J., last month.

815

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How High Will Metal Prices Go?

(Continued from Page 45)

Among the metals demanded will be copper, lead, zinc, tin, platinum, quicksilver, tungsten, manganese and antimony. But most of these metals are now plentiful. Thus manganese ore is the No. 1 strategic material listed by the Army and Navy Munitions Board. But stocks of manganese ore in Unted States bonded warehouses at the end of 1938 were close to 900,000 tons, the largest on record, due to over-accumulation in 1937 and disappointing steel operations in 1938.

It is the accepted fact, of course, that wars bring higher prices. But purchasing agents who buy the metals will undoubtedly weigh thoughtfully those many factors which will tend to keep prices within reasonable bounds. There will be some, of course, who will maintain that inflation was on the way and that the war is the trigger to set it off. Perhaps that theory is right, in which case the arguments presented above would generally fall down. There is also the possibility of an early peace, in which case all of these considerations would lose their force.

New Buyer For Braniff

COMMANDER J. A. MURPHY, U. S. Navy, retired, has been appointed purchasing agent for the Braniff Airways, Dallas. His last active assignment was as Executive Officer of the U. S. S. Oklahoma, and he had made his home in Carmel, California, previous to accepting the position in Dallas.

Buyers Transferred

J. C. RILEY, formerly purchasing agent for the Freeport Sulphur Co., at New Orleans, has been transferred to the Freeport, Texas, office in a similar capacity, succeeding H. M. WRIGHT who takes over the purchasing duties at New Orleans.

Harris Addresses Coal Men

T. W. Harris, Jr., Division Purchasing Agent of E. I. du Pont de Nemours Co., Wilmington, and Chairman of the N.A.P.A. Committee on Coal, addressed the third annual coal conference at Morgantown, W. Va., September 10th, on "Use Classification of Coal."

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HACK SAWS — **STEEL TAPES**

DIAL INDICATORS

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We're hustlers when the occasion demands but we don't make any noise about it. Our service is as cheerful and quiet as it is speedy.

BISMARCK HOTEL-CHICAGO

RANDOLPH AND LA SALLE

O. E. McClatchey

(Continued from page 42)

lightful not only because of the game dinner but for the uncommon angle of purchasing and sales relationship on a social basis.

One such hunting expedition a few years ago nearly accomplished what the German machine gun bullets failed to do. Mac was riding in a bus from Ft. Smith to Little, Ark., to join a hunting party enroute by plane to Alabama. During the night he fell asleep in a front seat. The bus crashed hard into an automobile. Mac was catapulted through a window and almost bled to death before a surgeon could reach the remote country place and take the 23 stitches necessary to close the lacerations.

Fishing is another outdoor sport highly favored. A trip of this character also had disastrous consequences which shocked Tulsans. A party of four, including McClatchey, were fishing in nearby Spavinaw Lake. In some manner the boat got too close to the spillway, hurtled over the 100 foot fall, and landed in the shallow, rocky-bottom creek below. Mac was one of the two survivors. He was jittery for a long time after this incident.

One so well known and so responsive to appeals of all kinds, inevitably would be called upon to take part in community affairs. He has long been an active worker for the Tulsa Chamber of Commerce. As a member of the important Oil Industry Committee of the organization and frequently as Chairman of their branch house membership committee, he has performed notable service. In recognition of his valuable assistance, the Chamber has conferred life membership on him, this being one of only three such distinctions.

The Tulsa Community Fund is

another organization which has been the object of his solicitude and efforts. For the past eight years he has acted as branch house chairman. Many loyal friends in purchasing and sales circles are glad to join with him in these undertakings.

EVERYBODY who knows Mac thought his spare time was fully occupied with these many outside diversions. Consequently they were surprised, or maybe they were not, when recently he was elected chairman of the Tulsa Chapter of the Society for the Preservation and Encouragement of Barber Shop Quartet Singing in America. This is a highly coveted position. As everybody knows, disharmony is a mental characteristic of group singers, whether in church choirs or barber shop quartets. But there wasn't a sour note struck when Mac was named. Just what he is going to do with his responsibility nobody knows. He may learn to solo in a plane, but a platform solo might result in a nose dive.

Dr. Sigmund Spaeth, the famous "tune detective" of New York City, was in Tulsa when Mac assumed his duties as leader of the singers. It was a thrilling moment when Mac introduced the distinguished visitor to a large gathering. It was an anxious moment when it came time for the vocalizing. Fortunately, it is believed, the good Doctor took the lead and carried the crowd through all the old favorites, including "Sweet Adeline." Mac's mouth moved in unison and he must have been singing. Even this would not surprise those who know his versatility.

—H. M. C.

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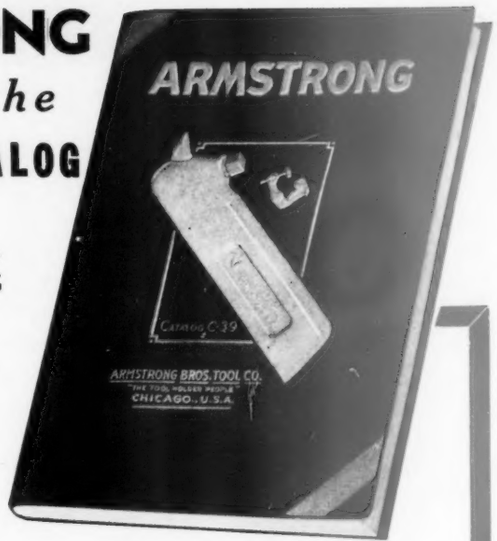

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Cunningham Safety Steel Type and Holders will give you more and better impressions than other marking devices. They are manufactured from the world's toughest commercially-made tool steel, and they're immune from mushrooming and spalling.

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We are equipped to furnish *Wire* in all our alloys for all purposes in gauges from .017 to ½ inch diameter. *Bristol Rivet Wire* has been specially processed for the manufacturer of *Tubular, Split* or *Common Rivets. Bristol Screw Wire* will produce round, flat, oval or washer head *Screws* with full perfect heads and threads.

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Brass and Copper Alloys
SHEET · ROD · WIRE
Established 1850

F. O. B.

(Filosofy of Buying)

AND now comes the real test of purchasing efficiency, as we change abruptly from a long period of buyer's markets and enter into a very definite seller's market condition. It's an old story for some of the veteran buyers, who have been through the transition before, both ways, but a real test for the newer generation brought up in the relatively simple conditions of the past few years when the man with an order to place was always right.

● ●

Sign of the times: When prices started to soar last month, the New Jersey State House Commission declared a "period of emergency" and gave State Purchasing Commissioner F. J. Brodesser emergency powers for 30 days, to contract for a million and a half dollars worth of supplies without the customary advertising for bids.

● ●

THERE are various ways of meeting an emergency. Two directly opposed policies were reported almost simultaneously in the press. The Philadelphia *Record* of September 8th stated that Purchase Director W. F. Knauer of that city was speeding up purchases and spending to the limit of his central warehouse revolving fund, stocking up for the duration of the administration on sugar, flour, tires, fuel oil, gasoline, tools, iron and steel products, coal and forage. The Savannah (Ga.) *News* of September 9th reported that Finance Supervisor H. F. Meyer, facing a comparable situation, decided on cutting down to actual current needs to conserve the municipal budget; indefinitely postponing the contemplated purchase of new police cars, public works trucks, and a couple of Diesel motors for the city pumping station; and discouraging any additional appropriations. Maybe they are both right.

● ●

Most difficult of all is the position of the industrial buyer under orders from his management to purchase heavily, and carrying out his instructions with one troubled eye fixed ahead on the inevitable period of liquidation.

● ●

PURCHASING agents, congenital foes of monopoly in any form, claim for themselves no

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WRITE FOR BULLETIN 305

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monopoly in moderation or economic farsightedness. They will be among the first to give the accolade of approval to the statement of policy promptly issued by the Lincoln Electric Co. of Cleveland, over the signature of its president, J. F. Lincoln—a grand example of how not to profiteer. Perhaps you have read it, but it bears repeating:

"The world is entering a crisis, the result of which no one can foresee. Other wars have brought inflation, followed by unemployment and depression after peace was achieved. America's experience in the World War illustrates this fact.

"Much of this post-war trouble would have been eliminated by a more foresighted price policy on the part of manufacturers and distributors. Price inflation by the seller when he had a dominant position resulted inevitably in reaction with deflation, depression and suffering. Many of those price increases were not warranted.

"Before such an inflationary cycle of prices is again started, we publicly pledge ourselves as far as possible, to maintain present prices.

"Further, if the materials we buy are increased in price, or the cost of labor is increased, then we pledge ourselves to raise selling prices no more than the bare increase in cost of raw materials and labor going into our products.

"Further, we pledge ourselves to pass on to our customers the reduction in cost made possible by better manufacturing methods, wider distribution and technical advances in production."

● ●

Commissions on business volume may be O.K. as a basis of salesmen's compensation, but the system doesn't go in purchasing. So, and very wisely, says Governor Bricker of Ohio as he terminated a purchasing department arrangement paying 10 cents a ton for clearing coal orders at the Athens State Hospital. The job is now on a salary basis.

● ●

CLEVELAND wholesalers in August designated September as Market Month, with the slogan "Cleveland has it and can ship it." They didn't expect to be put to the test so promptly.

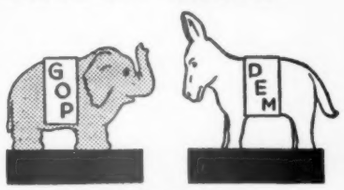
The VICTORIOUS ACE SQUADRON
Battle-Proved Masters in the Realm of STAPLING MACHINES
SCOUT $1.50*
CADET $3.00*
PILOT $4.00*
CLIPPER $4.50*
ACE $6.00*
Superior Performance and Durability have earned them that coveted Award of Merit—
*EAST OF ROCKIES

WORLD-WIDE LEADERSHIP IN SALES

"An ACE always comes out on Top"

Recommended and Sold by:—
STATIONERS and OFFICE SUPPLY DEALERS Everywhere
PRODUCTS OF ACE FASTENER CORPORATION—CHICAGO

PREMIUM PRIZE AND NOVELTY GOODS



MAGNETIC NOVELTIES . . . .

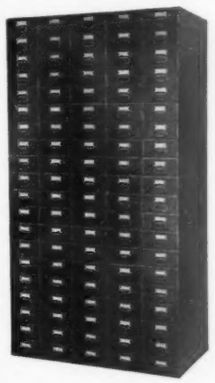
Here is the vest pocket novelty sensation of the hour. Famous political enemies, (G.O.P. Elephant and Dem. Donkey) are mounted on unusually powerful G. E. Alnico magnetic bases. They attract, repel, twirl, giving an amazing performance. Special instructions enclosed for Republicans and Democrats. An ideal novelty giveaway. Each pair in box. (Cut actual size). Order No. P15x57x. Per dozen $2.25. Per gross $24.00. 4 pair postpaid $1.00. We also carry Jitterpups, black and white scotties, as above. No. P15x54. Per dozen, $2.00. Per gross $21.60.

CATALOG OF MERCHANDISE FOR ALL OCCASIONS

For that golf tournament, card party, bingo game, carnival, holiday celebrations, good will gifts, you will find the Hagn line of merchandise outstanding. If it's a diamond wrist watch or a teddy bear, we have it and at prices that are right. Send for copies of our latest catalogs for your files today. No obligation, no salesman to bother you.

JOSEPH HAGN COMPANY

Wholesalers Since 1911
217 & 223 West Madison Street
Chicago, Ill.



To House Your Canceled Checks

This compact group of 100 SAFE-T-STACK Steel Storage Files provides efficient housing for over 400,000 cancelled checks.

They are "Tailor-Made" to fit the checks they contain. For this reason they only occupy a space of 86¼ inches high, 46⅝ inches wide and 24 inches deep.

The exclusive SAFE-T-STACK slip key locks individual files together horizontally and vertically. No tools, bolts or rivets are used.

Write for a quotation on a SAFE-T-STACK Steel Storage File to fit your check size. No obligation of course.

The Steel Storage File Co.,
2216 W. 63rd St.,
Cleveland, Ohio.

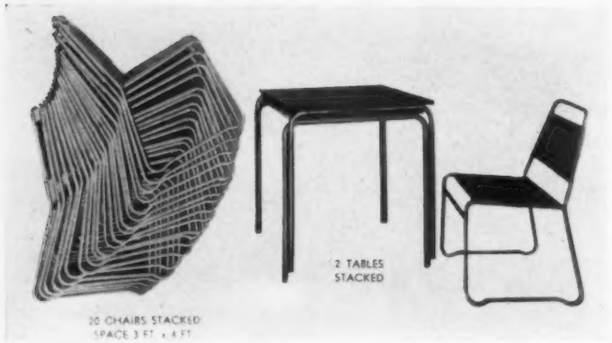
The size of our check is..... inches wide x.....inches high. Please quote on Steel Storage Files to fit.

Name .....

Business .....

Address .....

NEW PRODUCTS & IDEAS



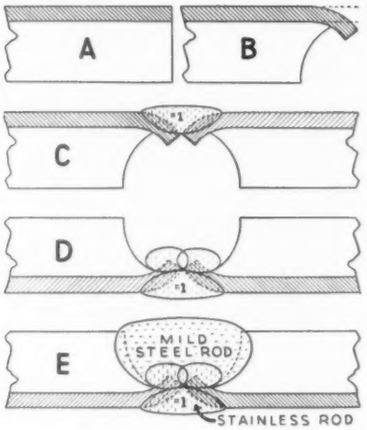
SPACE SAVING FURNITURE

FILLING a need long felt in many public auditoriums, clubs, ships, shops, hospitals, schools, etc., this new all-welded furniture is light in weight for easy handling, and is designed to nest compactly when not in use, requiring a minimum of floor space. The line includes side chairs, armchairs, and tables. The frames are of bent tubing, steel or rust-resisting alloy, welded for strength, at the same time sealing all openings against moisture and oxidation, and eliminating squeaks and looseness. No wood whatever is used. Seats and backs are easily removed for cleaning and disinfecting. In use, they adjust themselves automatically to the most comfortable sitting position. The frames are furnished in a variety of finishes —satin bronze, pewter, chrome, baked enamel, or stainless steel. Seats and backs come in Dupont Fabrikoid or Cavalon, in 14 oz. Navy duck, vat dyed to any shade, or in 1½ to 2-inch sponge rubber. Manufactured by Swan Engineering Co., 410 Frelinghuysen Ave., Newark, N. J.

INSPECTOR'S HAMMER

ADAPTED for the stamping and marking of castings, shafts, pipe, etc., for determining blowholes, and for use by boiler, bridge and railroad inspectors, this new hammer is announced by the M. E. Cunningham Co., 150 East Carson St., Pittsburgh, Pa. It is made of tough and durable Super Casco safety steel, immune from mushrooming and spalling, and is available in four standard sizes from ¾ to 2 lbs. Interchangeable plugs at either end of the hammer are held securely in place by special spring pines, making it possible to have a company insignia or special symbol at one end, and a chisel or prick edge at the other.

WELDING STAINLESS-CLAD STEEL



A NEW METHOD of welding stainless-clad steel has been developed by the Composite Steel Division of the Jessop Steel Co., 576 Green St., Washington, Pa., which eliminates the lessening of corrosion resistance in the weld zone even when a mild steel rod is used in welding the backing. The process is shown in the diagram above. Figure A shows the plate as supplied, the shaded portion representing the cladding. The plate is scarfed and the cladding bent down with a follow-up tool or hammer as shown in Figure B. The primary weld is made with a ⅛-inch stainless coated rod (C-1) at the juncture of the two claddings. The plates are then turned over and secondary welds are made on the under side of the exposed cladding, using 3/16-inch stainless coated rod (D-1). The final weld is then made with mild steel coated rod as in E, and the bead (E-1) is ground flat with the cladding. The stainless rod should be richer in alloy than the cladding, and the welding is done as rapidly as possible and with the lowest practicable amperage. Tests of such welds, including 24-hour exposure to a 20% salt spray mist, show no more corrosion in the weld zone than in adjacent parts. The use of mild steel on the backing permits great savings in cost of rods.

OIL FAUCET

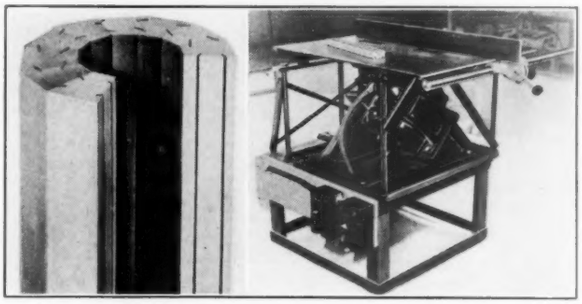
FASTER FLOW and quicker shut-off without dripping are two of the important advantages claimed for the new "Molygate" oil faucet recently announced by the Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago, Ill. Designed especially for dispensing lubricating oils, paints, varnishes, glue, vegetable oils, molasses and other viscous fluids from barrels and drums, the shut-off valve has been located right at the end of the nozzle. It is operated by simply pushing down the handle; as soon as handle pres-

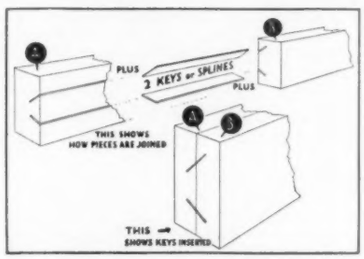
THE PURE
PURE THREE POINT LUBRICATION
A Complete Line of Industrial Petroleum Lubricants
THREE
PURE
Ask a Pure Oil Engineer to help solve your lubrication problems
OIL CO.
CHICAGO U.S.A.

sure is released, a stainless steel spring causes it to close immediately and to shut off all drip. It can be locked in open or closed position. The seat is of neoprene, vulcanized into the valve head. Bronze or nickel finish in two sizes—¾-inch and 1-inch, I.P.T., for standard and sealed drums. The ¾-inch faucet will flow 2 quarts of SAE 50 oil at 78° F. in 9 3/5 seconds under a 2-foot head.

EXECUTIVE FILE

HAVING many desirable and exclusive features, making it unlike any other desk side file, this new improved unit will appeal to purchasing agents as well as all other executives. The executive file, a product of Automatic File & Index Co., 629 West Washington Blvd., Chicago, Ill., permits one hand reference to both upper and lower drawers at the same time as a result of the V-shaped opening provided by the expanding drawer feature found in both drawers. There is no danger of the file tipping forward when the lower drawer, which operates on ball bearing progressive slides, is fully extended. Both vertical and visible records may be housed together in the unit. The easy lifting top has a lock controlling both drawers. Units are available in both letter and cap sizes. Easy rolling silent casters permit portability. Finishes are standard olive green and beautifully grained walnut, mahogany and oak. A special index is available combining the advantages of both visible and vertical filing principles and especially suitable for the personal requirements of all executives.





SPLINE LOCK

A SIMPLE and efficient method of joining wood, metal, tile, plastics, or any combination of such materials, is the Homer Spline Lock, utilizing a pair of splines, or keys, inserted in matched grooves to hold two surfaces in the desired face-to-face position. Production work is done with moderately priced precision equipment or with hand tools on the job. It speeds up assembly, reduces costs, makes difficult joints not only possible but easy, and results in a strong and superior permanent joining. Among the many applications are sash and doors, block flooring, furniture of all sorts, interior trim, theatrical work, airplane assembly, brick walls, etc. Besides its use in making tight immovable joints, it is likewise efficient as an accurate

EVER HEAR OF "CASE-HARDENED" CLOTH?

Case-hardening? Why that's a process for steel -- a hardening of the surface face so that it's practically impossible to break through it into the ordinary steel below.

Yet that is practically what is done with National's linen-finish buckram binding, available in ring binders like that shown above and in Nat-Lock post binders.

The whole fabric is impregnated with a new, modern plastic, and then the surface is polished under pressure into a hardness and toughness that defies the most vicious wear.

It's impossible to scratch, won't scuff or mar (you could even grind your heel on it) and *won't stain*. Surface stains can be wiped off with a damp cloth. Hence these books always look fresh and new.

Next time you buy ring binders or post binders, ask your stationer to show you National's new linen-finish buckram jobs, Ring Binders No. 6308 or 3781 and Post Binder No. N9203 series.

NATIONAL BLANK BOOK CO.
HOLYOKE, MASS.

7 sizes, 1 pint to 5 gallons

JUSTRITE SAFETY CANS

are the safe, efficient, economical way to handle and store explosive and flammable liquids. Because they are labeled by the Underwriters' Laboratories and approved by the Associated Factories Mutual Fire Insurance Companies, they will actually earn you *lower* insurance rates!

JUSTRITE OILY WASTE CANS

are winning an enviable reputation for reduction of the hazards of oily waste disposal. They open by foot pressure—close automatically—and, also labeled by the Underwriters' Laboratories, they pay for themselves in lower insurance rates!

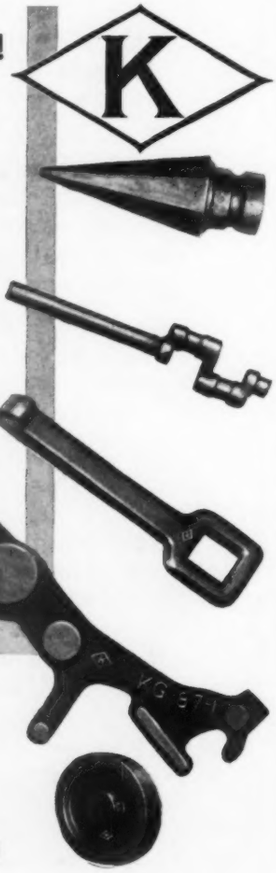
• • •

All leading mill supply and hardware distributors will be glad to show you Justrite Safety Products. Write us for your FREE copy of "Save on Fire Insurance."

6, 8, 10, 14 gallons

JUSTRITE MANUFACTURING COMPANY
2058 SOUTHPORT AVE., CHICAGO, ILL.

Where Greater Strength Is Needed!

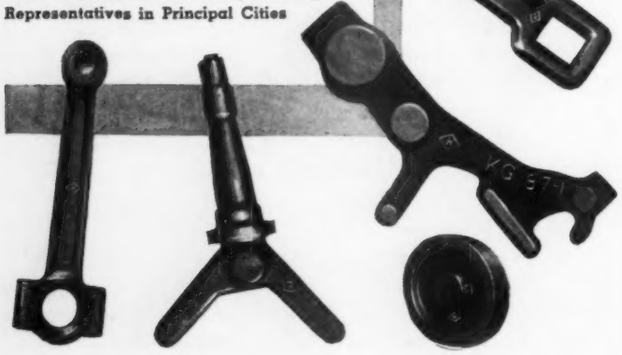


For all stress parts, Kropp forged steel parts provide greater strength —strength to resist breakage, fractures, bending or twisting under abnormal stress conditions.

Kropp makes "forgings to your specifications"—drop, steam hammer and upset forgings—any size, any shape, any quantity, rough finished, heat treated or fully machined. We carry large stocks of specification steels on hand at all times and can quickly take care of your requirements.

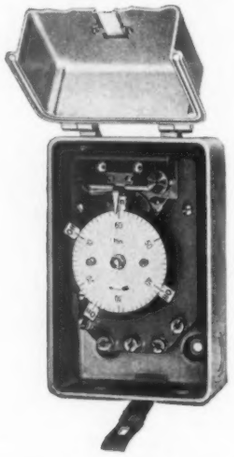
Send us your drawings for a quotation, or let us have our representative tell you about the World's Largest Job Forging Shop.

KROPP FORGE COMPANY
5301 W. Roosevelt Road, Chicago
Representatives in Principal Cities



guide or runway affording any required degree of even tension for windows, drawer or table slides, lathe work-holders, etc. The Doughty Marketing Corp., 342 Madison Ave., New York City, is sole licensing agent for this device.

ELECTRICAL TIME CONTROL



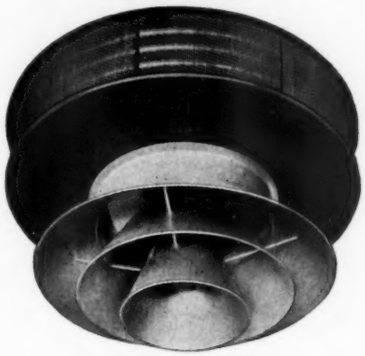
FRESH from the drafting board, and entirely new in design is the new Type C.T. Cycle Timer, manufactured by the R. W. Cramer Co., Centerbrook, Conn. It will continuously close and open a single circuit at any pre-set operating interval, or alternately close and open two circuits. Some typical uses are the control of coal stokers, starting and control of sludge pumps and other electrically operated machinery, day and night operation of thermostats, etc. It is featured by a variety of time ranges—eight different scales ranging from 60 seconds to 24 hours per revolution; and the possibility of two cycles of operation, independently timed in respect to each other, for each revolution of the dial.

PRINTING CALCULATOR

ELECTRIC multiplication and direct automatic division, with printed proof of all factors in every calculation, are the outstanding features of a new machine just announced by Remington Rand, Buffalo, N. Y. Given the name Printing Calculator, it is the first machine of its kind. In addition to standard listing, adding and direct subtracting features, the Printing Calculator multiplies and prints on the tape a complete record of every multiplication problem—multiplicand, multiplier and product. Since only one line is printed for each digit of the multiplier, the machine conserves a sizable amount of adding machine paper. A multiplier counting dial eliminates the need for counting or listening to the number of cycles made by the machine. Automatic direct division replaces the present cumbersome method of dividing by reciprocals. After the dividend and divisor are introduced into the machine and printed on the tape, the calculation is performed automatically, with quotient and remainder likewise printed as a permanent proof of accuracy. A semi-automatic decimal indicator abolishes the necessity for pre-determining the decimal place in division problems. In addition, an automatic decimal cipher prefix prints ciphers automatically before a decimal quotient when required.

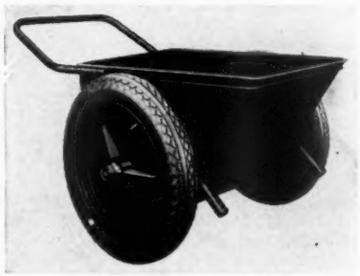
Advantages of the Printing Calculator, as a result of the printed record it prepares: First, there is no idle machine time, for the printed results can be recorded later if dsired. Second, the operator saves time by recording one calculation while the machine automatically performs the next division problem. Third, proof of accuracy is estab-

lished permanently. There are no dials to read and clear before going on to the next problem. Fourth, each calculation can be readily indexed by a reference number, printed on the tape and designated non-add. The Printing Calculator is also available with a 13-inch-wide movable paper carriage, to permit the recording of calculations on permanent, tabulated form. Listing and totaling capacity of the machine is 10 columns or up to $100,000,000.00. It is extremely compact, requiring only 8"x15¼" of desk space, and weighing less than 25 pounds. A Universal motor permits its use on direct current as well as on any cycle of alternating current.



PROJECTION UNIT HEATER

THE Trane Company, La Crosse, Wis., is now offering its projection unit heaters furnished with the Anemostat, originally applicable only for duct installations but now adapted to the downward air stream, affording efficient and draftless distribution even in workrooms with low ceilings, without waste of floor space. It is useful for stores, offices, greenhouses, and industrial plants wherever low velocity air currents, free from dust, are essential.



CONCRETE CART

MODEL B dump cart of the Red Star Products, Inc., 12910 Taft Ave., Cleveland, Ohio, features pneumatic tires and Timken bearings for easier wheeling, and body design with front legs and smooth hopper giving proper balance and clean dumping. The combination results in more haulage per man, faster handling and more loads per day. Construction is rugged and simple, making it economical in cost and operation. Available in two capacities —6 and 9 cubic feet.

BUY THIS GENUINE SPEEDWAY ½" DRILL

AND GET THESE FEATURES

At The Lowest Price Ever Made on a Quality Drill of this Size

- High Torque Speedway Drill Motor
- Streamlined Air Cooled Die Cast Case
- Natural Grip Direct Thrust Breast Plate Handle
- Removable Side Handle for Close Quarters
- Self Aligning Oilless Bearings
- 500 R.P.M. Operating Speed
- Smooth Sliding Thumb Switch
- Permanently Beautiful 2-Tone Finish

Complete with hand operated 3-jaw ½" chuck, rubber covered cord, unbreakable plug.

This SpeedWay No. 89 Drill is the result of 30 years of specialization in the manufacture of portable tools.

Write for Circulars and name of nearest dealer.

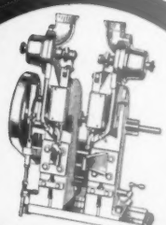
SpeedWay Manufacturing Company
1877 S. 52nd Ave.
Cicero, Ill.

Sharp
AND STRONG AS THE TEETH OF A WOLF...
TEST them any way you wish—in comparison with others on a grade for grade basis. Cut for cut, blade for blade, dollar for dollar, LENOX BLADES will hold their own.
Sold by distributors everywhere in "HIGH SPEED," "MO-SPEED," "TUNGSTEN," "SUPERFLEX."
LENOX
HACK SAWS
BAND SAWS
AMERICAN SAW & MFG. CO.
SPRINGFIELD, MASS., U.S.A.
Buy "the Blade in the Plaid Box"

AUTOMATIC RIVET SETTER WITH Adjustable CENTERS

Sets 1 or 2 rivets at a time

For radios, switches, toys, electric parts and appliances, auto parts and accessories, and other small assemblies.



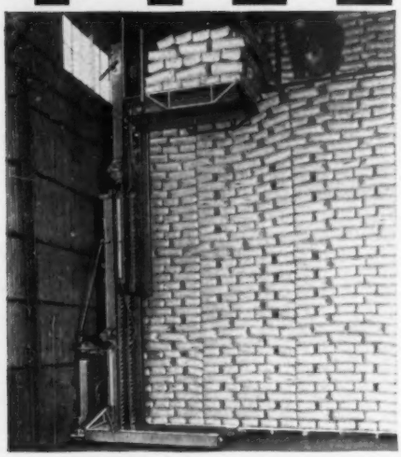
Centers adaptable to 6". For setting rivets up to ¼" body diameter. Bench and pedestal types.

Will give you volume production savings even on short assembly runs. Less capital investment.

No obligation for assembly analysis. Send sample or blueprint with inquiry.

CHICAGO RIVET & MACHINE COMPANY
TUBULAR AND SPLIT RIVETS IN ALL RIVET METALS
1851 SO. 54th AVE. (Cicero P. O.) CHICAGO, ILLINOIS

PILE HIGH



to lower storage costs!

Barrett Portable Elevators—hand or electric—solve many storage problems. With them you get the most from your floor space by piling boxes, barrels, bags, bales, crates or rolls many tiers high. And they save on plant maintenance work. Models for handling dies and loading trucks from floor level; also stationary inter-floor, turntable and telescoping types.

There's a Barrett Portable Elevator for every requirement of industry. Write for Portable Elevator Catalog showing application in many types of plants.

BARRETT

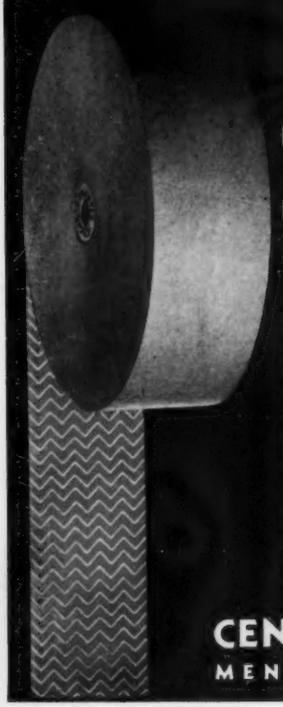
BARRETT-CRAVENS CO.

3280 West 30th Street • Chicago, Illinois

Representatives Everywhere

Barrett Handling Equipment

SAFETEX GUMMED TAPE



Pull-tab opener in every roll.

•

Processed to make it pliable and non-curling.

•

Grooved glue surface for better moisture distribution.

•

No. 1 Northern Kraft only.

•

Highest grade glues for fast and permanent sealing.

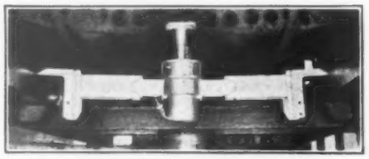
CENTRAL PAPER Co.

MENASHA, WISCONSIN

PIPE BENDER

TWO new and improved models of the Porto-Power pipe bender are announced by the Blackhawk Mfg. Co., Milwaukee, Wis. Model S-36 weighs only 190 lbs., uses a 20-ton hydraulic unit, with hand operated pumps, and handles seven sizes of rigid conduit and pipe from 1¼ to 4 inch diameters. The simplified one-piece bending ram eliminates thirteen various extension bars, tension arms, studs, etc., used in the previous model. Portability is increased with wide-rims on the pivot shoes, acting as wheels for rolling the unit along. Model S-30A is similar in principle, uses a 10-ton hydraulic unit, and handles pipe ranging from 1 to 2 inch diameter.

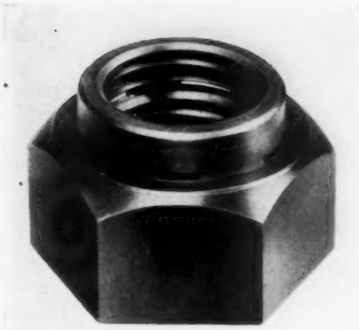
PIT LIFT AIR JACK



FOUR MODELS of this new Alemite pit lift air jack are announced by the Stewart Warner Corp., 1828 Diversey Parkway, Chicago, Ill., adaptable to ordinary pits, drive-on and rotary lifts, and free-wheel lifts, as found in service stations, fleet repair and maintenance shops. All models are operated by compressed air, and have a capacity of 1½ tons. Contact is made where lifting pressure may best be applied, on axle or chassis frame member, and the jack saddle elevated up to 5 inches. Thus the lubrication points are relaxed so that lubricant can flow freely to all bearing surfaces. Holding the car weight without shaking or rocking, it speeds up lubrication, makes draining and flushing more convenient, and permits a more thorough job. Wheel removal, tire changes, and tire chain adjustments are likewise handled with greater ease.

AIR COOLED TRANSFORMER

THREE streamlined models in a new line of air cooled power transformers cover all standard voltage characteristics from ¾ to 10 KVA, in auto and insulated types. The manufacturer, Acme Electric & Mfg. Co., Cleveland, Ohio, claims that high full load operating efficiency is maintained through design and construction features such as full air draft external ventilation; specially wound, hand finished coils, with high dielectric strength insulation between layers; cores of thin gauge low loss steel; and balanced proportion of core and coil. Adapted for lighting load distribution from a power line, and for industrial applications where oil-cooled transformers may affect the fire risk.



SAFETY NUT

DESIGNED and manufactured for industries whose fastening problems are made more difficult because of shock and vibration, this new "Stay-On" safety nut developed by the Lamson & Sessions Co., Cleveland, Ohio, has successfully been adapted to numerous industrial applications, such as in rock drills, vibrating screens, and road machinery. The locking action is automatic and positive, and is not dependent on special threads, springs, pins, or other extra parts. The locking portion consists of a raised crown section, slotted perpendicular to the axis of the nut. This section is distorted to form an elliptical ring, so that this integral part of the nut has a smaller diameter at two diametrically opposite points than the bolt or screw on which it is applied. The nut is double heat treated to give the crown a permanent set and tough resilient spring action. When applied, the nut spins on the bolt until the threads meet the locking crown. The nut is then wrenched on, forcing the crown to assume the circular cross section of the bolt, with a resulting gripping action producing the necessary friction to prevent movement of the nut on the bolt. It will remain locked in any position, and can be applied repeatedly without loss of locking action and without harming the bolt threads. Requires no special tools. It can also be furnished in aluminum and its alloys, brass, bronze, or stainless steel.

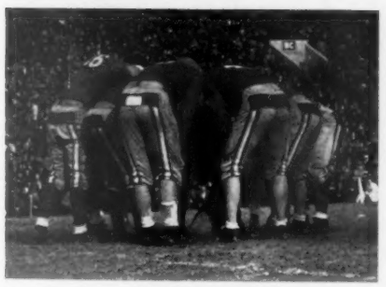
COPY HOLDER

HANDSOME enough to be used in any office, and embodying a number of unique and practical features of design, is this new copy holder recently introduced by the Durabilt Steel Locker Co., 490 Arnold Ave., Aurora, Ill. The angle at which copy is held can be readily adjusted to the individual preference of the user for greatest convenience and efficiency. A thin ball-type chain, 12 inches in length, is attached to the front half of the holder, and any part of the chain slides easily into a slot on the rear half to set the copy at any desired degree of slant. Two sturdy spring clips hold the copy firmly in position, and further support is provided by a curled bottom edge to fit a stenographic note book. Rubber feet protect the desk surface and prevent slipping. The holder measures 11½"x8½", and is finished in olive green crackle.

WELDING COMPOUND

THE new Protect-O-Metal Compound manufactured by G. W. Smith & Sons, 2016 E. Third St., Dayton, Ohio, offers to the welding and die-casting industries an effective

Prepare for a LONG RUN!



A run of 150 if you wish!

No spoilage discard
No off-register —
and NO PRINTED FORMS—

No fumbling or fouls with these clean-running Master Backs! . . . . No printed forms to buy—and waste! . . . Every copy clean perfect register!

● Ideal for internal shop forms, invoices, etc.

Just fill-in on typewriter as usual . . . (any color you wish) . . . insert in duplicator drum . . . & RUN—on BLANK PAPER!

The PROCESSED NEGATIVE HECTOGRAPH Master

It even gives you contrasty, faster-reading SECOND COLOR FILL-IN at no extra expense!

COST-SAVING
TIME SAVING
SIGHT-SPARING
PRACTICAL

For Information & Demonstration write:

MANIFOLD SUPPLIES COMPANY

Makers of PANAMA and BEAVER Hectograph Carbon Papers

188 THIRD AVENUE ● BROOKLYN, N. Y.

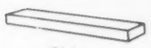
Cut Costs WITH KENNAMETAL*

REDUCE WEAR OF VITAL PARTS

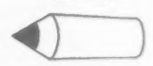
Have you investigated the many strategic points in your plant where the introduction of this new hard metal will save you money? It has saved others thousands of dollars in applications such as those listed below.

1. Gage and Micrometer Tips. KENNAMETAL outlasts steel gages 50 times, chrome plated gages 20 times. At left below are some of the many shapes supplied for tipping gages.

Gage and Micrometer Tips

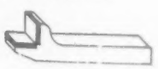

Strip

2. Follow Rests.
3. Lathe and Grinder Center Nibs.


Lathe and Grinder Centers

Solid Disk

4. Drill Tips for masonry, stone, etc.
5. Jig Drill Bushings.
6. Valve Tips.


Follow Rests

Ball

7. Centerless Grinder Rests.
8. Wire Guides.
9. Electrode Coating Dies.
10. Wire Coiling Tools.
11. Sand Blast Nozzles.

Sand Blast Nozzles

Washer

12. Tips for tongs on glass working machinery.

Think of KENNAMETAL where wear is encountered! Consult us about your problem.

* No. 2 of a series of advertisements describing the many useful applications of this new hard carbide material.

try "RED STREAK" SEALING TAPES

• Do you have trouble making your present sealing tape stick to boxes and packages? Are you haunted by too many damage claims due to faulty sealing? If so, now is the time to insist on Red Streak Sealing Tape. Plenty of good, strong animal glue assures quick and permanent adhesion . . . tough No. 1 Kraft holds shipments securely. It's the tape you should buy, even if you're looking for a "price" tape . . . Red Streak costs no more!

The BROWN-BRIDGE MILLS TROY, O.

WRITE FOR SAMPLES

Let us prove that Red Streak Sealing Tape will save you money. Write today for your free sample roll.

RED STREAK TAPE

Red Streak

WITH THE RED STREAK CORE

SEALING TAPES

F M

DIESELS
MOTORS
PUMPS
SCALES

4 Major Lines... ONE Responsibility

Diesel Engines for stationary or marine service, 10 to 1400 horsepower . . .

Pumps with capacities from 1⅓ g.p.m. to 150,000 g.p.m. . . .

Motors from ¼ to 10,000 horsepower . . .

Scales that record weights from .002 oz. to 1,000,000 lbs. . . .

—All backed by the one, century-proved responsibility of Fairbanks-Morse and serviced by a nationwide organization of 36 branches.

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FAIRBANKS, MORSE & CO.

Manufacturers

GENERAL OFFICES

600 South Michigan Avenue, Chicago, Ill.

means of checking the destructive elements of friction, corrosion and adhesion customarily present in high-heat processes. It is said to eliminate 80% of weld cleaning time. The compound is brushed on the surface to be welded, and after welding is wiped off with a clean cloth, removing all splatter and surface oxides. It likewise forms an excellent priming coat for a paint finish, prevents the formation of rust on steel after welding, and materially increases the tensile strength of the weld. In die-casting, it is sprayed on the surface of the die, making a heat-resistive coating that prevents the molten metal from sticking to the solid metal, and allowing for perfect ejection of the castings. The film retains its protective qualities for 25 or more shots of metal, and is equally effective for deep drawing dies, permanent molds, and drop forging. In actual production tests with Protect-O-Metal, it has been found that core pins will not break off, be worn undersize, nor gauld due to the shrinkage of the molten metal, a difficulty frequently encountered in the casting of aluminum.

PRICE MARKER

ADAPTING the principles which have saved time, labor and money for large mercantile establishments in the marking of their merchandise, to the requirements of the smaller store, engineers of the Monarch Marking System Co., Dayton, Ohio, have developed the hand-operated Pathfinder pricing machine illustrated above. It will correctly, legibly and indelibly print the requisite information—such as cost, lot, style, price, etc.,—and affix the markers without damage to merchandise, at the rate of 100 per minute. It is adapted to use with pin tickets, string tags, sew-on tags, fold-over tickets, gummed labels, button tags, Kimflex tickets, or slip-fold tickets. The marker weighs only eight pounds, and is completely portable for use at any station in the establishment. It requires no special training for the operator, as the specially designed type fits into the chase with each character independent of the others, and no locking up of forms is necessary.

GAS-FIRED UNIT HEATERS

USING either natural or manufactured gas as fuel, and applicable for many types of buildings such as stores, garages, schools, and manufacturing plants, this new series of unit heaters offers a range of five models with capacities from 85,000 to 200,000 B.t.u. per hour. They are equipped with automatic flues for venting the products of combustion from the interior of the building, this arrangement consisting of a motor and blower so connected as to commence operating whenever the heater starts to work. The assembly also includes a safety pilot which turns off the gas in the event that the pilot goes out or burns too low to insure ignition. The complete unit is suspended from the ceiling, out of the way. The gas fires into a combus-

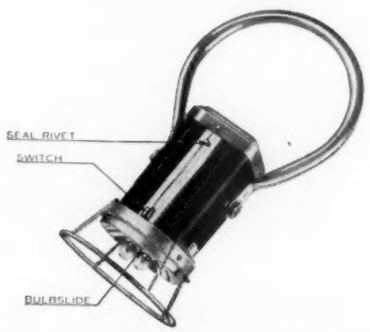
tion chamber, and the heated products of combustion pass upward into a bank of tubes before being carried outside. Air is passed around the tubes by means of a motor-driven fan located on the back of the unit. In addition to heating, the device may be used for other purposes such as ventilating, cooling and drying. The Automatic Gas-Steam Radiator Co., 485 Brushton Ave., Pittsburgh, Penna., is the manufacturer.

WASTE RECEPTACLE

PSYCHOLOGY plays a part in the design of this new waste receptacle for washrooms, developed by the A. P. W. Paper Co., Albany, N. Y. The small top opening invites the user of paper towels to wad the towel before discarding it, instead of throwing it at a large open top basket. In this process of wadding, the towel continues its drying job and cuts down consumption and waste when the user finds one towel sufficient to dry his hands. It is compact and can be hung on the wall if desired, releasing floor space for other uses. A hinge door at the bottom permits easy servicing whether on the wall or the floor.

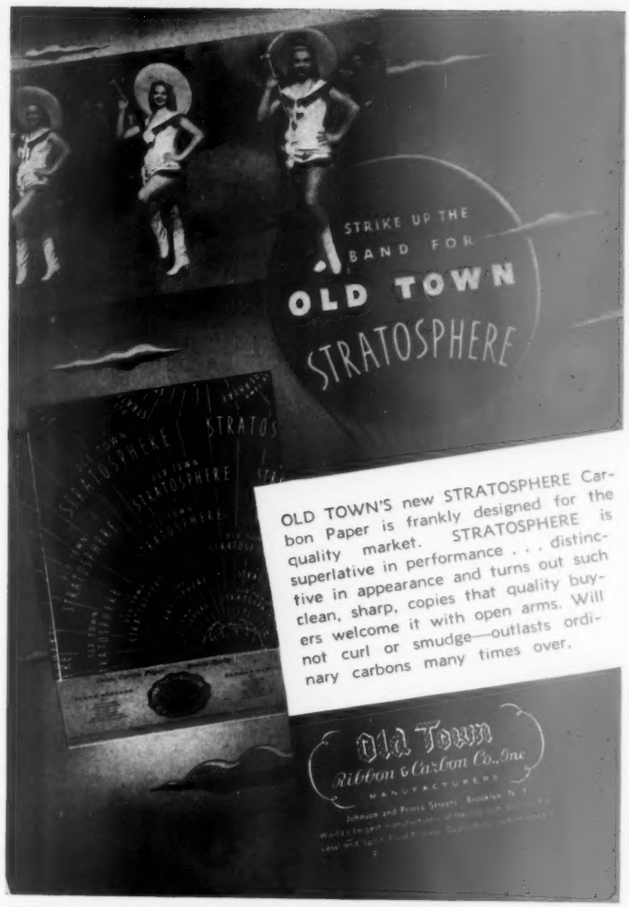
PORTABLE SANDER

THE new Mallsander, a product of the Mall Tool Co., 7740 So. Chicago Ave., Chicago, Ill., is a high powered heavy duty tool, streamlined in design, light in weight, and perfectly balanced for easy operation with right or left hand. It is powered with a high torque, cool running motor, spiral bevel chrome nickel alloy steel gears, and extra strong lightweight housings. Standard equipment includes 15 feet of cord, a seven-inch backing pad and abrasive, and a special spindle lock that fastens the spindle when removing or applying the abrasive disc, thus eliminating the use of loose wrenches that are easily misplaced.



SAFETY LANTERN

A NEW light weight safety lantern that incorporates an almost instantaneous emergency bulb switch, together with a number of other improvements, is announced by the Burgess Battery Co., Freeport, Ill. In construction, this No. RL-1 Safety Lantern has a light weight body with rust resistant trimming and adjustable aluminum handle. It is equipped with an Alzac non-tarnish replaceable reflector which throws a strong focussed beam, clearly outlining objects at 500 feet. The overall height with handle extended is 12 inches. The emergency lamp feature consists of a throw switch


STRIKE UP THE BAND FOR
OLD TOWN
STRATOSPHERE
OLD TOWN'S new STRATOSPHERE Carbon Paper is frankly designed for the quality market. STRATOSPHERE is superlative in performance . . . distinctive in appearance and turns out such clean, sharp, copies that quality buyers welcome it with open arms. Will not curl or smudge—outlasts ordinary carbons many times over.
Old Town
Ribbon & Carbon Co., Inc.
MANUFACTURERS

EVERYTHING FOR INDUSTRIAL SAFETY

Write for our complete catalog

•

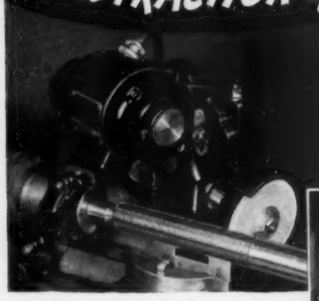
PULMOSAN

SAFETY EQUIPMENT CORP.

Dept. P, 176 Johnson St. Brooklyn, N. Y.

NOW.. GRIND THREADS at a FRACTION of Former Cost

New ATTACHMENT Revolutionizes THREAD GRINDING



Set up Grinder by easy instructions

Wheel is quickly, accurately dressed

Quickly, easily convert one of your lathes into a precision machine for grinding threads. An amazing new attachment for a Dumore No. 5 Grinder does the trick . . . costs but a small fraction of the usual investment for special thread grinding machines . . . requires no installation expense . . . no extra power. Can be set up and operated by anyone who can chase a thread. Ask your Dumore distributor for demonstration in your plant. No obligation.

THE DUMORE COMPANY, Dept. 359-K RACINE, WISCONSIN

DUMORE

PRECISION GRINDERS

BARNES BETTER Band SAWS

Barnes Band Saw Blades are hard-edged for fast, accurate cutting and long life. There's a Barnes distributor near you!

W. O. BARNES CO., INC. Detroit, Mich.

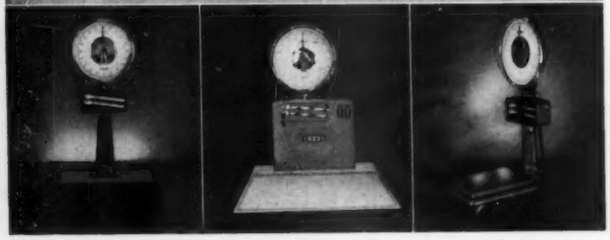
KRON

DIAL SCALES

for industry's every need

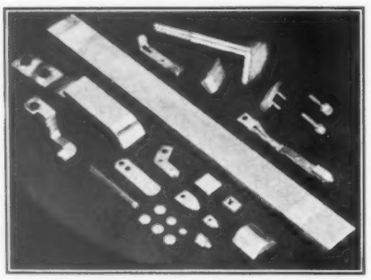
THE KRON CO.

BRIDGEPORT CONN.



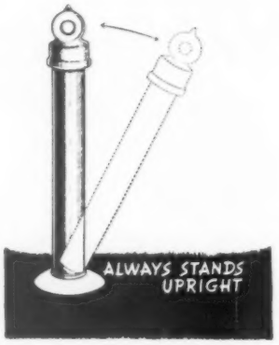
which both slips the burned out lamp out of position and replaces it with the auxiliary bulb—in focus—with a flip of the thumb. Colored bulbs may be used if desired. The light is visible from all four sides of the lantern, and the adjustable handle will readily accommodate heavy winter gloves. It operates on a single 6-volt battery.

ELECTRICAL CONTACTS



ILLUSTRATED are some of the many shapes available to manufacturers of electrical equipment, made of a new powdered metal composition known as Gibsiloy, developed by the Gibson Electric Co., 551 Blvd., of the Allies, Pittsburgh, Pa.. Because of its ductility, this material can be formed into a wider variety of shapes than those similar materials which, owing to their brittleness, must be cast to form. It can be punched, machined, drilled, tapped, and otherwise worked as easily as ordinary alloys. It possesses the high conductivity of pure silver, as well as the low, constant resistance, and can be made to hardnesses up to 200 Brinnell. It is available in a variety of compositions and grades for varying physical properties, and can be used solid or with a backing of base metals.

SPRING-BAK FENCE POST



CONSTRUCTED with an inner spring design, this unique fence post can be bent to a full 90 degrees in any direction, but will come back immediately to the upright position. It is consequently in complete alignment after accidental jolts that would break or bend ordinary posts, and looks well without constant and expensive upkeep or repair. The posts stand 20 inches above ground and are set 12 inches deep in concrete. The post itself is of seamless tubular rail-steel cap, center bushing and spring anchors of galvanized malleable iron. Equipped with extra heavy rust-proof oil tempered 10-inch spring. Furnished in green with silver tops, or all aluminum finish. Manufactured by the Berghman Co., 1417 Washington Blvd., Maywood, Ill.

WASHABLE COVER FOR BINDERS

THE Federbush Co., 91 Seventh Ave., New York, N. Y., introduces a new line of loose-leaf ring binders, with stiff covers of heavy board covered with washable luggage cloth. This material, silver gray in color and with a glossy finish, is both attractive and durable, resists soiling, and can be washed without damage.

Status of Trade Pacts

TESTIFYING at a Washington hearing in connection with the revised trade agreement with Belgium, Arthur Besse, President of the National Association of Wool Manufacturers, urged that the government should terminate all existing trade treaties rather than negotiate new ones. He suggested that this country should await the end of the war as a fitting time to make a thoroughgoing examination of the entire tariff structure and to appraise our policies of international trade.

Textile Trends

An estimate of fourth quarter consumption of the leading textile fibers has been made by the Rayon Organon, indicating the following trends:

Cotton. Estimated consumption, 1,900,000 bales. This compares with 1,800,000 bales consumed in the third quarter and 1,730,000 bales in the second quarter. Available stocks of the staple are of course very high, and manufacturing capacity is ample. The steadily rising use is a direct reflection of rising demand, orders for the entire quarter being already on the mills' books.

Wool. Estimated consumption, 110,000,000 lbs. This compares with 105,000,000 lbs. in the third quarter and 85,400,000 lbs. in the second quarter. Available stocks of wool are described as adequate-to-low, and some problem of procurement looms if the present rising trend of use is accelerated.

Silk. Estimated consumption, 90,000 bales. This compares with 96,000 bales in the third quarter and 80,000 bales in the second quarter. Stocks of raw silk are adequate, and there is some question in the trade as to whether the reported figure does not actually underestimate probable demand. It is scarcely likely that the 1938 rate of consumption will be equalled in this quarter, but there is a fair possibility, at least, that third quarter volume will be maintained or slightly exceeded.

Rayon Yarn. Estimated consumption, 85,000,000 lbs. This compares with 97,000,000 lbs. in the third quarter and 82,000,000 lbs. in the second quarter. The fourth quarter figure has been arbitrarily set at full capacity for the industry, for stocks of rayon yarn held by producers were down to less than two weeks' supply at the beginning of the quarter, whereas the larger total of the preceding period included some 19,600,000 lbs. of yarn that were drawn from stock, and that source is no longer available. The reduced consumption reflects no falling off in demand, but a definite limitation of supply.

Rayon Staple Fiber. Estimated consumption, 32,000,000 lbs. This compares with 25,000,000 lbs. in the third quarter and 22,400,000 lbs. in the second quarter. As in the case of rayon yarns, producers' stocks are low.

Smith Addresses Railroad Men

CHARLES E. SMITH, Vice President in charge of purchases, New York, New Haven & Hartford Railroad, spoke at the October meeting of the New England Railroad Club at the Touraine Hotel, Boston. The topic of Mr. Smith's address was "Unfinished Business." He contrasted the self-supporting position of the railroads with taxpayers' support of other types of transportation, pointing out the inequalities of present regulation.

Hausman Enters Law

MARTIN C. HAUSMAN, assistant to the purchasing agent of the Electro Motive Corporation, Division of General Motors Corp., and in charge of steel buying for that organization, has resigned to engage in the practice of law on his own account, with offices at Chicago and LaGrange, Ill.

Get the Point!

BOSTONS are thoroughbreds when it comes to pointing pencils. Saves time, pencils and cold cash. The clever 8-hole guide fits pencils of every standard size. Note the 15 Cutting Edges—exclusive Boston feature. Makes a perfect point—No waste. Sturdily built to give 25% more service. Ask for Boston KS at your stationers.

C. HOWARD HUNT PEN CO. CAMDEN, N. J.
Manufacturers Hunt Pens, Clips and Speedball products.

BOSTON
PENCIL SHARPENERS

His headache..

is *Your* headache, too!

Style RR50 is one of more than 300 different types of WILLSON Goggles designed for every conceivable industrial use and condition.

The minute one of your men slows down it starts to cost money . . . and nothing slows a man down quicker than the splitting headaches caused by faulty goggle lenses.

Protect your company's investment in men by standardizing on WILLSON Industrial Goggles. Their flat, Super-Tough lenses are uniformly toughened for protection—accurately ground for undistorted vision.

WILLSON Safety Service can be applied to your plant—without charge or obligation. Write for complete information.

GOGGLES • RESPIRATORS • HELMETS • GAS MASKS

DOUBLE WILLSON
PRODUCTS INCORPORATED
READING, PA., U.S.A. Established 1870

GEARED
to meet the Urgent demands
OF YOUR PRODUCTION LINE

Consider these points when you look for a dependable source of spring parts:

INTELLIGENT HANDLING OF SPECIFICATIONS
PROMPT, CERTAIN ACTION IN TOOLING UP
DELIVERIES TO MEET YOUR PRODUCTION
UNIFORM QUALITY FROM START TO FINISH
ONE SOURCE OF SUPPLY FOR MANY PRODUCTS
EFFICIENT PLANNING FOR GREATEST ECONOMY

Controlled quality from steel to finished part is Barnes' answer to the day's demand for production and still more production. A modern steel mill owned and operated by Barnes is capable of producing stock for almost any requirement, every day. Large amounts are always on hand for quick conversion into the kind of spring you need.

The Wallace Barnes Company . BRISTOL, CONNECTICUT
DIVISION OF ASSOCIATED SPRING CORPORATION
SPRINGMAKERS FOR MORE THAN THREE QUARTERS OF A CENTURY
Barnes-made SPRINGS

CEL-U-DEX
Loose-Leaf Sheet
PROTECTORS
PAT. PENDING
• TRANSPARENT • FLEXIBLE
• REINFORCED EYELETS
• WATER PROOF
CEL-U-DEX CORP. 1 MAIN ST. BROOKLYN N.Y.

Uses: Salesmen's Kits, Advertising and Sales Presentation.
Catalogs, Stamp Collections, Photos—Albums, Records.
KEEP SHEETS SPOTLESSLY CLEAN
Send for Samples and give name of your Stationer

MARVEL

Tomorrow's
Blades—TODAY!

Thousands of users; in fact, everyone who knows cutting steels and tools recognizes that MARVEL High-Speed-Edge Hack Saw Blades are far-and-away the finest that can be made—that there is no equal steel—that only the patented composite MARVEL Blade can have this cutting edge and at the same time be positively unbreakable in fact. Heavy duty high speed, automatic production sawing machines have been made practical only because of MARVEL'S high speed and unbreakable qualities. The cutting edge is of 18% Tungsten High Speed Steel, welded by a special process to a tough alloy back. Thus they are made **positively unbreakable.**

1. 18% High Speed Tungsten Steel Cutting Edge.
2. Integrally Fused by electric weld.
3. Tough alloy back: positively unbreakable!

Increase the efficiency of your equipment—get higher running speeds and greater feed pressures, be assured of more cuts per dollar—turn to MARVEL High-Speed-Edge Hack Saw Blades!

ARMSTRONG-BLUM MFG. CO.
"The Hack Saw People"
5760 Bloomingdale Ave., Chicago, U. S. A.
Eastern Sales Office: 199 Lafayette St., New York.
Buy From Your Local Distributor

Buy Marvel Blades from your local distributor.

Conservative Price Policies

A report by George A. Sloan, Chairman of the Consumers' Goods Industries Committee, which is making a study of raw material prices and their effects upon general business, indicates that most manufacturers are following a conservative price policy. There is little tendency to discount in advance the possibility of shortages and further price rises. Mr. Sloan's report says, in part:

"The chief problem affecting prices growing out of the European situation is the price advance in imported raw materials due to shipping difficulties and priority demands of belligerents. With some major commodities of this character price advance and threatened shortages have caused a serious problem to manufacturers in this country.

"There has been a definite increase in domestic industrial activity for several months which has served in part to offset the shock of the sudden impact of price advances in raw commodities. Quantitatively this compensating cost factor, arising from increased volume of production, varies with industries and with companies within an industry. It cannot, therefore, operate uniformly or indefinitely. In the meantime, it is obvious from information reaching our committee that this whole subject is having the earnest consideration of business executives who are acutely conscious of its implications to continued recovery."

The report is supplemented by numerous individual statements from representative industrial leaders. For example:

ALFRED P. SLOAN, JR., President, General Motors Corporation: "We are strongly of the belief—and that will dictate our policy—that prices of goods and services should not be advanced beyond the economic necessity of doing so through increased items of cost that make such action imperative. And, in consideration of that question, weight should be given to any possible favorable effect on cost through increasing volume.

"The increase in costs resulting from advanced prices of commodities used in the manufacture of our products, amounted to substantially 15% since the first of September. We have not, however, in general, advanced our selling prices, and, in addition, our values have been increased in the 1940 models through improvements of various kinds."

F. W. LOVEJOY, President, Eastman Co.: "During the period of 1914 to 1918 the price level of Eastman Kodak products in the United States was kept practically constant. During the present war crisis the Eastman Kodak Co. will again use every effort to follow a similar policy. We have made no price increases and anticipate none unless substantial and unforeseen increases in cost make it absolutely necessary."

A. L. VILES, President, Rubber Manufacturers' Association: "We have been struggling with a most difficult situation in crude rubber which has given great concern to all consumers, i.e., crude rubber in the New York market advanced from slightly over 16 cents to a top of approximately 25 cents in four or five days, due to speculative pressure.

"Our principal raw materials are cotton and rubber, although we are heavy buyers of various chemicals and other compounding ingredients. Rubber has advanced from 30 to 35% since the end of August. Cotton yarn and fabrics such as we use, from 3 to 11%. There has been no general increase

in the prices of finished goods to meet these rapid advances in raw material costs except adjustments in a few products where increased costs greatly submerged current prices; probably not more than 5% in most instances. It would seem safe to anticipate with respect to the next six months that normal improvement and employment might be reasonably expected to increase up to approximately 10%."

W. K. HUBER, Comptroller, the Procter & Gamble Co.: "Our raw materials have increased in price from 40 to 50% since the first of September. Sales prices for household uses have advanced approximately 4%. Don't look for any appreciable increase in our employment in our industry due principally to the fact that during the past number of years there has been very little, if any, decrease."

EARL CONSTANTINE, President, National Association of Hosiery Manufacturers: "Prudent management will refrain from increasing prices except as this becomes economically necessary as in the case of meeting unavoidable increased costs in labor or commodities.

"Recent increases in mill prices of hosiery have been conservative. In the case of silk hosiery they fall short of compensating for the sharp increases in the cost of raw silk. In the case of seamless goods increases reflect principally increased labor costs resulting from the application of the new Wage and Hour bill. Our manufacturers today are paying over $3 a pound for their silk, compared to $1.75 a year ago. This is an increase of 71%.

De LANCEY KOUNTZE, Chairman, Devoe & Raynolds Co.: "We have experienced a decided advance in the cost of certain raw materials, particularly in chinawood oil. Linseed oil has moved up 25%. All other oils which we use in the manufacture of paint have advanced. So far we have not advanced our manufactured prices, but may be obliged to later in a few specialties. We are acutely conscious of the importance of going slowly in these price matters."

HOWARD HEINZ, President, Howard Heinz Co.: "While certain commodities such as sugar and flour made large advances there was no advance in any of our large basic commodities, such as tomatoes and pickles, bought under contract with growers. By and large hundreds of articles which we use in our products have changed very little in price, with the result that there has been only slight advance in three or four of our products."

VERNE BURNETT, Vice President, General Foods Corporation: "The percentage of increase in cost of our major commodities since the end of August is: Corn, 11%; wheat, 24%; sugar, 31%; coffee, 5%; cocoa beans, 20%; cotton sheeting, 20%; babassu kernels, 27%; tapioca flour, 40%; corn starch, 14%. Up to the present time there has been no material increase in our manufactured prices, as we have not had to use the higher-priced commodities purchased since August 31. Employment demand has already increased substantially."

JOHN STUART, President, Quaker Oats Co.: "No indication that processors are taking advantage of present war situation to widen profit margin. We have made no advances in our advertised goods. What we all want is volume, which means increased employment. Unwarranted price advances reduce buying power."

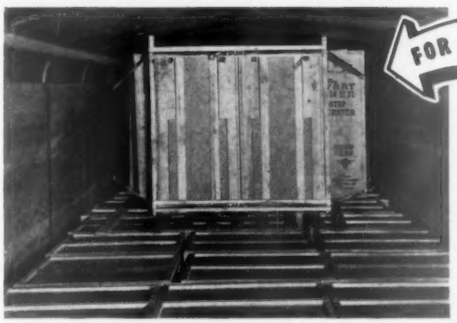
DAMAGE CLAIMS CUT

on Fast Freight, LCL and Stop-Over Shipments

●As a P. A., you've seen purchasing practices undergo a change right in your own firm. With new, fast freights moving goods at express train speeds, your firm can safely buy some items in minimum quantities. That means more orders—and smaller orders.

But do you realize that your firm's customers, too, have gradually changed their buying habits? That many of your products once shipped in carloads now move in LCL or stop-over shipments? That high speed transport means more chance of damage to goods?

A thorough analysis of old shipping methods is called for in order to find out if they're still the cheapest and the best. Call a Signode representative to tell you—without obligation—how Signode Tensional Steel Strapping can be applied to any shipping problem and save your firm time, money and customer good-will. Meanwhile, write for full facts. Ask, too, about Signode Strap Cutters.



FOR EXAMPLE

Changed buying habits of Stewart-Warner customers called for stop-over shipments of refrigerators. The Signode Anchor Strap loading method illustrated solved the problem—and saved 30% per car over previous cost.

SIGNODE STEEL STRAPPING CO.
2602 N. Western Ave., Chicago, Ill.
371 Furman St. Brooklyn, N.Y.
454 Bryant St. San Francisco
40 Offices Throughout United States and Canada

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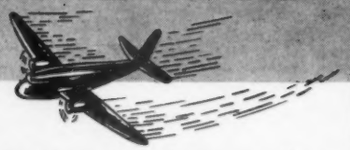

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Purchasing and Traffic Course at Seattle

The Purchasing Agents Association of Washington is sponsoring an 11-week course in "Purchasing Policies and Traffic Management," open to purchasing agents and assistants and others interested. The class is meeting at the W. P. Fuller & Co. auditorium, and the first session was held on Tuesday evening, September 19th.

The first seven meetings are being conducted with purchasing men themselves serving as chairman and discussion leaders, and with the cooperation of teachers from the staff of the University of Washington. The four concluding sessions, scheduled in view of the fact that 65% of the Association members are in charge of traffic for their companies, are under the direction of E. H. McAvoy, Seattle traffic expert. The complete course outline is as follows:

September 19. "The Organization of a Purchasing Department." Chairman, Robert Morton, Purchasing Agent of W. P. Fuller & Co., assisted by Maury Schwartz, Purchasing Agent of Federated Metals Division, American Smelting & Refining Co.

September 26. "The Scope of a Purchasing Department and Its Place in the Company Organization." Chairman, Hall Johnson, Assistant Purchasing Agent of the Washington Cooperative Egg & Poultry Association, assisted by M. F. McClane, Purchasing Agent for the same organization.

October 3. "General Purchasing Policies." Chairman, H. F. Price, Purchasing Agent of Bethlehem Steel Co., assisted by J. B. Veilleux, Purchasing Agent of Fresh Milk Division, the Carnation Co.

October 10. "Buying the Proper Quality and Quantity." Chairman Harry Beetham, Purchasing Agent of Luckenbach S. S. Co., assisted by H. R. Morrison, Purchasing Agent of Union Oil Co.

October 17. "Buying at the Proper Price." Chairman, Charles Gilpin, Purchasing Agent of Pacific Fruit & Produce Co., assisted by C. R. Ragsdale, Purchasing Agent of Seattle Tent & Awning Co.

October 24. "Buying the Proper Service." Chairman, E. R. Thatcher, Purchasing Agent of Standard Oil Co., assisted by Harry Miller, Purchasing Agent of Electrical Products Consolidated.

October 31. "Choosing the Vendor." Chairman, Silas Rich, Purchasing Agent of Seattle Public Schools, assisted by Jack Reardon, Purchasing Agent of Barde Steel Co.

Traffic Management

November 9. "Tariffs." Necessity for filing; various kinds; what they consist of.

November 14. "Freight Rates." Class; commodity; special; local; transcontinental.

November 21. "Classification." Rules governing classification; ratings; packing requirements.

November 28. "Interstate Commerce Acts." Formal complaints; informal complaints; reparation; methods of handling docket.

Purchasing Course at Boston University

Robert C. Kelley, Purchasing Agent, Converse Rubber Company and past President of the New England Purchasing Agents Association, will conduct a course in Purchasing and Stores Control at Boston University College of Business Administration in the new building at 685 Commonwealth Avenue at Granby Street, Boston.

The class will meet each Tuesday evening, from 7 p. m. to 9 p. m., for fifteen weeks beginning October 3rd.

Topics to be discussed include the following: Charting a Purchasing Program in Our Present Economy; Developing an Effective Purchasing Technique; Office Procedure, Methods, and Systems; Quality Control, Specifications, Inspection; Determining Quantity Requirements; Price Policies; Speculative Purchasing; Purchasing Budgets; Maintaining Contacts With Markets; Buying Technique; Knowledge of Commodities and Supplies; Traffic Problems; Legal Aspects of Purchasing; Measuring Purchasing Efficiency and the Purchasing Department Library.

JOHN W. DORMAN, formerly with the purchasing department of the Tide Water Associated Oil, at Tulsa, and more recently in sales work with the Bridgeport Machine Co., has joined the sales organization of the Moorlane Co. in the Tulsa territory.

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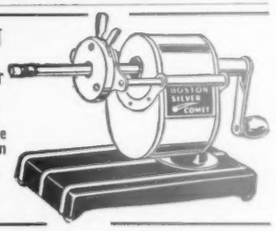

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State Course in Purchasing

The Massachusetts Department of Education has announced that it will again offer the popular course in "Industrial Purchasing" which in the past three years has enrolled 150 students representing more than forty different New England industries including textiles, leather, coal, soap, paper, rubber, chemicals, plastics, food, and utilities. The course is offered under the auspices of the University Extension Division.

Joseph Sawyer has been reappointed as instructor for the course. Mr. Sawyer is associated with the R. H. White Company of Boston, and is also Instructor in Purchasing at Northeastern University. He is a graduate of Harvard College and the Harvard Graduate School of Business Administration, the author of "Purchasing Supplies for Chain Stores" and of numerous business articles in *Forbes Magazine, Purchasing, Chain Store Age,* and other publications. Two years ago he made a study and report on the possibilities of centralized purchasing for the Town of Belmont, at the request of the Taxpayers' Association of that community.

The course deals with the procurement of materials and equipment used in industry and trade. It is open to those engaged in purchasing, or in other departments of business who are interested in learning about the purchasing function and its relation to the other essential functions of a business organization; also to salesmen in the industrial field who wish to become better acquainted with the entire purchasing process. Lectures will be supplemented by discussion of actual business cases involving the principles brought out in the class work. Guest lecturers include Harry J. Graham, Secretary of the New England Purchasing Agents Association and editor of the *New England Purchaser,* and F. Albert Hayes, General Purchasing Agent of the American Hide & Leather Co., and past president of the New England Association.

The course will meet on Wednesday evenings from 7:45 to 9:15 P. M., starting November 1, at Room 30, Sever Hall, Harvard University, Cambridge. Enrollment may be made at the first meeting of the class, or prior to that time at the office of the Division of University Extension, Room 217, State House, Boston.

Baltimore Exhibit

Seventy-one manufacturers will be represented in the Fourth Annual Manufacturers' Products Exhibit sponsored by the Purchasing Agents Association of Baltimore. The exhibit will be held at the Lord Baltimore Hotel, October 24th, 25th, and 26th. Awards will be made for the most attractive and the most informative booth, the Committee of Judges including H. A. Cannon, Supervisor of Accounting Service, Consolidated Gas Electric Light & Power Co.; George Cobb, Chief Engineer, City of Baltimore; and Joseph A. Helprin of J. A. Helprin Advertising Agency. Frank H. Carter, Purchasing Agent of the Maryland Drydock Co., is General Chairman of the exhibit. A list of committee chairmen was published in the September issue.

Address by Nicholson

J. W. NICHOLSON, City Purchasing Agent at Milwaukee, was guest speaker at the initial fall meeting of the Forty Minute Men at the Central Y.M.C.A. in that city, September 28th. His subject was "Purchasing—Its Relation With Our Community." The Central Board of Purchases, established in 1918, saves hundreds of thousands of dollars annually for the city's taxpayers through the careful supervision of the expenditure of tax funds for the purchase of materials, supplies and equipment used in the operation of city services. Approximately three and one-quarter million dollars was spent for necessary material during the past year. Centralized governmental purchasing saves an average of 15% through simplification, standardization, the use of proper specifications, competitive bidding, buying the right quantity at the most propitious time, examining and testing merchandise for compliance with specifications, and obtaining all earned trade and cash discounts.

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D. J. TUEPKER, for the past three years purchasing agent of the Public Service Company of Oklahoma, at Tulsa, has been chosen to head the company's newly established Department of Customer Relations.

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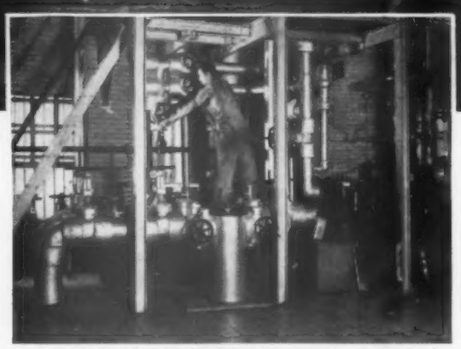

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